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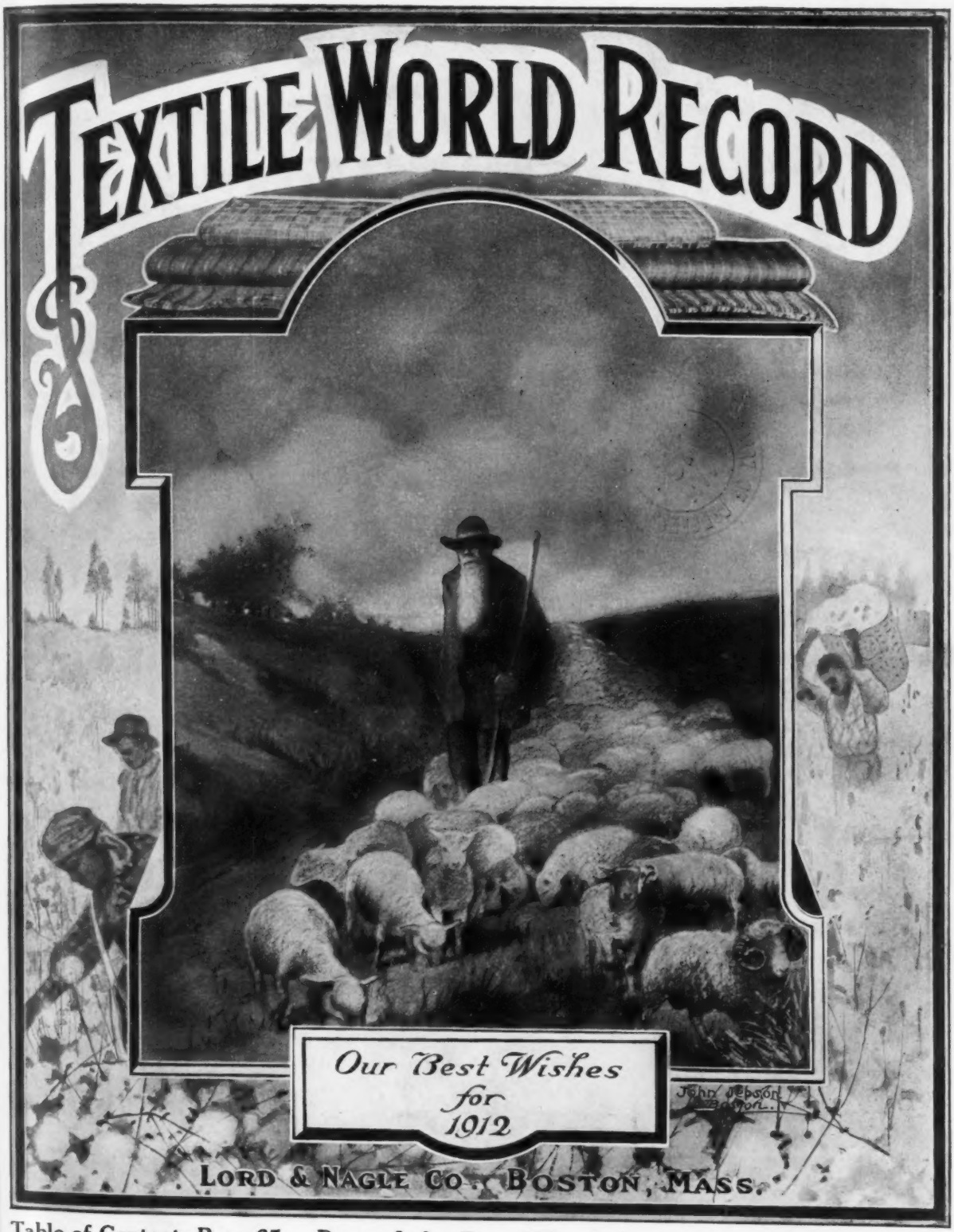
TEXTILE WORLD RECORD



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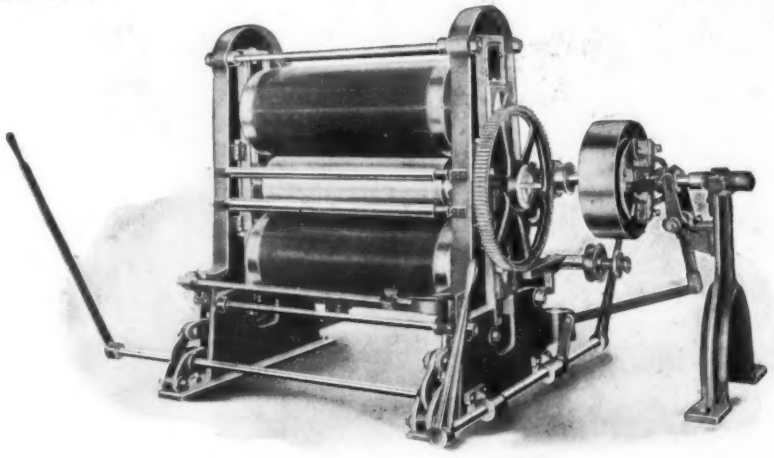

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Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

HOWARD & BULLOUGH
AMERICAN MACHINE COMPANY LTD.

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A GREAT IMPROVEMENT IN CARDING.

This device consists of a Roller covered with Special Clothing placed underneath the Lickerin, and revolving slowly in the same surface direction as the Lickerin.

A Doffing Comb placed in front of the Roller removes from same the substances which the Roller eliminates from the cotton, which then fall to the floor amongst the droppings.

This Device has no high speed parts to cause wear, and is so simple that derangement is impossible, consequently requires very little attention.

The object of this appliance is to remove motes, leaf, short fibre and foreign substances from the cotton, before it reaches the Cylinders and Flats.

This naturally increases the life of the Card Clothing, as it is not being subjected to as rough usage as would be the case if the substances removed by the Duplex Device were allowed to pass on to the Cylinders and Flats, besides which, the Clothing is at all times in much better condition to give superior Carding, and requires much less Grinding.

The quality of the Carding is very much improved by the removal of the objectionable substances referred to, and will produce a much better quality of yarn.

By this Device, without altering the Card Settings, the amount of waste taken out may be varied considerably, according to the class of cotton and quality of work desired.

Production is increased considerably, owing to the cleaner condition of the Cylinder and Flats.

DUPLEX CARDING DEVICE
HARDMAN'S PATENT

The Cylinder, Doffer and Flat Strips can be put into the regular mixing, as they contain less short fibre and foreign matter.

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CLB251037

TEXTILE WORLD RECORD

JANUARY, 1912

Monthly Comment.

The New Year

To subscribers and advertisers, to all our friends, we extend best wishes and sincerely hope that this New Year will bring to all a full measure of prosperity, of peace and contentment.

Boston Wool Statistics

The Boston Wool Trade Association, in accordance with the plan announced by us last month, issued on Jan. 1, 1912, its first report of the stock of wool remaining unsold in Boston on that date. Because of the importance of this plan the resolution by which it was inaugurated is given here:

That each firm of corporation represented in the Boston Wool Trade Association, shall, on the last Saturday of December of each year sign a true statement of the amount of foreign and domestic wool they have on hand unsold at that time belonging either to themselves or to consignors, stored in Boston or in the immediate vicinity of Boston, and mail this statement promptly to a firm of chartered accountants (to be selected) who shall receive same under a written agreement to keep all details absolutely confidential, but shall report the totals of each class to the secretary of the Wool Trade Association on or before the following Tuesday noon. The secretary shall give these figures at once to the trade papers and this shall be the authorized statement of the stock of wool in Boston as reported by the Boston Wool Trade Association. In the event of any house not reporting its stock and in order that the summaries may not be misleading, it shall be decided by the executive committee whether the names of such houses not reporting shall be published or whether a list of houses reporting shall be published, or both.

The first report issued to the press in accordance with this resolution is as follows:

Editor Textile World Record:

Below please find total stock of wool on hand and unsold in Boston Dec. 30, 1911, as tabulated by Messrs. Gunn, Richards & Co., accountants for the Boston Wool Trade Association.

Very truly yours,
Geo. W. Benedict, Sec.

Territory, California, Texas .....lbs.	48,393,319
Fleeces (grown east of the Mississippi River, and Minnesota, Iowa and Missouri)	6,516,957
Scoured	5,623,678
Pulled	2,046,169
Foreign, Class 1 and 2	4,800,054
Foreign, Class 3	2,259,763
Total .....lbs.	69,639,940

As explained in the resolutions the statement covers only the wool on hand and not sold to spinners.

The appearance of this report is a noteworthy event in the textile trade. Although an accurate statement of the unsold wool in Boston is of great value, the full importance of the Boston Wool Trade Association's plan will be found in its extension to include not only the unsold wool in the United States, but also the consumption of wool by the mills and the wool on hand at the mills and not put into process of manufacture. A pound of wool unsold or unused in the United States outside of Boston has as much effect

on the balance of supply and demand as a pound of wool in Boston has. For this reason the extensions of the plan will follow naturally if the Boston experiment is well managed; the beginning offers strong assurance that this will be the case.

Another point to bear in mind is that the value of such statistics increases as the years pass, by enabling comparisons of stocks with those in previous years. This is well illustrated by the statistics of the consumption and mill stocks of cotton throughout the world, compiled semi-annually by the International Cotton Federation. The first report gave the mill stocks on Aug. 31, 1905, and the consumption for the preceding year. It covered mills operating 46,726,929 spindles in eight countries, out of a total of approximately 110,000,000 spindles for the world. Each subsequent year has marked a rapid advance toward completeness so that the last report, for Aug. 31, 1911, covered mill stocks and consumption for 121,277,197 spindles out of a total of 137,278,752 for the world. Some idea of the extent of the undertaking by the International Cotton Federation is obtained by recalling that the reports include every part of the cotton manufacturing world, and that the last one covered a stock of 2,619,052 bales of cotton, valued at say $130,952,600, and a consumption for the year of 17,819,070 bales, valued at $890,953,500. In the fall of 1907 the International Federation included returns from the United States obtained from our Census Bureau. In the following spring, 1908, the Census Bureau not being in a position to supply the figures, the Federation mailed the blanks to the office of the Textile World Record, and we distributed them to the cotton mills of this country with the result that a very satisfactory report was obtained from this country for March 1, 1908. Since that date the Census Bureau has supplied both spring and autumn statistics.

The plans of the International Cotton Federation and of the Boston Wool Trade Association correspond in essential details. The returns are compiled in each case by public accountants so as to eliminate the possibility of the individual reports being disclosed. In each case the statistics are promptly made public for the benefit of the entire trade. And in each case the trade is cooperating with remarkable enthusiasm in the compilation of the figures. This is shown in the case of the wool statistics by the fact, stated to us by Secretary George W. Benedict, that the first report includes returns from 99 1/2 per cent. of the Boston wool trade. We congratulate the new association on the result and shall watch with interest for the extension of its reports to include all stocks of wool in the country not put into process of manufacture, and also statistics of wool consumed by the mills. Great advantages would result to the entire trade. Speculation and violent fluctuations would be checked, and information would be available that would enable wool growers, dealers and manufacturers to base their business plans on facts and not guesses.

The Duty on Silk Noils

The much discussed ruling by the Treasury Department imposing a specific duty of 35 cents a pound on silk noils was reversed on Dec. 15 by the Assistant Treasurer, who issued it originally. The order of reversal, which went into effect on Dec. 16, is as follows:

After the silk is hackled it is combed or dressed. The first combing results in about 50 per cent. of the hackled silk being taken from the combing machine or dresser as combed silk, and about 48 per cent. is noils. Such noils are usually termed "first draft noils," and still contain approximately 37 1/2 per cent. of the total quantity of the silk fibers to be recovered as combed silk by the entire combing process, about 62 1/2 per cent. having been recovered in the first combing. The noils are then again combed or dressed, the resulting products being termed second draft silk and second draft noils, respectively.

Such noils are again combed and result in "third draft silk" and "third draft noils." Such process is repeated until the noils have been combed four or five times in addition to the first combing of the hackled silk. By these repeated combings all the silk suitable for use in silk spinning is separated from the short fibers, tangled ends and refuse matter, which are sometimes termed "exhausted noils" and are not suitable for use in the manufacture of what is commercially known as spun silk yarn, but are sold for use in the manufacture of other yarns or fabrics. It is obvious that the noils resulting from the first, second and subsequent combings have not lost their dutiable

status as "silk partially manufactured" until they shall have become some other article provided for by the tariff act. This is not accomplished until the usable silk has become exhausted, when the noils become, so far as the manufacture of spun silk yarn is concerned, a waste. While such exhausted noils are not commercially known or bought and sold as silk waste they are, in fact, a waste and have been classified free of duty as "silk waste" for many years.

The Department is, therefore, of the opinion that silk noils other than exhausted noils are subject to duty under the provisions of paragraph 396 of the existing tariff act, and that such exhausted noils are in fact silk waste and as such are free of duty under the provisions of paragraph 675 of the said act.

It further appears that while there may be an occasional long silk fiber in such exhausted noils, the noils will be principally composed of fibers less than 2 inches in length, and that silk noils composed principally of fibers which are more than 2 inches in length do not in fact constitute noils from which the usable silk has been exhausted and are not, therefore, a waste.

You are, therefore, instructed that on and after December 16, 1911, all silk noils composed principally of fibers which are more than 2 inches in length will be classified as dutiable under paragraph 396 of the tariff act, and all such noils composed principally of fibers which are less than 2 inches in length, will be classified as free of duty under paragraph 673 of the said act.

To insure a uniformity of classification care will be taken by appraising officers that samples of all noils passed by them under each classification shall be forwarded to the United States Appraiser at New York in accordance with T. D. 31936 of October 21, 1911.

It now remains to be seen whether the courts will sustain the arbitrary rule laid down by the Assistant Secretary of the Treasury, providing that the difference between free and dutiable silk noils shall be determined by the length of the staple.

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Flax Exchange at Ghent

The leading flax spinners, dealers and commission merchants recently met in Ghent, Belgium, and formulated a plan for forming a flax exchange to be located in that city. The object is to provide improved methods of dealing in flax, the bulk of which now comes from Russia. The enterprise is in charge of the Cercle Commercial & Industrial, Rue dongue du Marais Nr. 15, Ghent, Belgium.

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The Egyptian cotton sales last year increased $13,882,550 over 1909, and $35,762,525 over 1908.

As Lancashiremen See Us

The second congress of the Textile Institute was held at Belfast, Ireland, last month Among the papers was one on "Textile Conditions in America," by William Davis, who had visited the United States a short time before and on his return gave his impressions of Americans to a British audience. His remarks and the discussion which followed were reported as follows:

Mr. Davis referred to the variety of nationalities among the operatives in American mills, and said it was interesting to note how each race seemed to occupy the department for which they had been found best adapted. For instance, at a cotton mill which he visited the bales were opened by Syrians, Greeks were employed in card rooms, at the roving frames were middle-aged Irish, the spinning and weaving were done by French Canadians and Belgians, whilst Italians and Poles were found most useful in the dyehouse. Various branches of the textile industry, however, tended to gravitate into their respective centers. Fall River had the cotton trade in predominance, the woolen and worsted industry concentrated around Lawrence, whilst the bulk of the knitting was in various towns in New York State. Factories were more isolated than in Britain, and it was not uncommon to find the same firm manufacturing a variety of goods on the same premises. The managers were men of varied experience, and frequently had a reliable knowledge of silk, cotton, woolen and worsted fabrics.

Mr. S. Oscar Hall (Bury) opened the discussion. He said he had visited America many times, and it had been forcibly brought to his mind that we had nothing to fear from American competition on the lines that Americans were working. (Hear, hear.) He considered that it had been a much over-advertised country in regard to business capacity. English people were always told that Americans were forever going in for up-to-date machinery, but he had been very much interested in seeing at work textile machinery which was made thirty years ago. He had seen looms in Lancashire of the same make as looms in America running at 25 per cent. greater speed, owing to improvements. He argued that Lancashire textile operatives and employers had an adeptness for textile work which was born in them—a condition which was not so noticeable in America.

Mr. Myers (Manchester) agreed with Mr. Hall that the Americans were not all they were "cracked up" to be. His impression on visiting the States was that they were not doing anything like the quality of work that was being done in England, especially in the cotton trade. He had seen them making fabrics that certainly could not be sold in England. Americans had a closed market, and that did not induct people to do their best.—(Hear, hear). He thought, however, there was more specialization in some American mills than Mr. Davis had spoken of.

Mr. Heylin (Manchester) also contended that in certain classes of cotton goods Americans worked

on the same lines as in Lancashire, but in visiting America he was not at all struck with the qualifications of the overseers that he saw.—(Hear, hear.)

Mr. Davis, in reply, said he agreed that in isolated places in America machinery could be found that was out of date, but the business organization in the large corporations was efficient. The manufacturers were promoting a steady population of workers, and they had come to the conclusion that the constant removing of people from place to place was detrimental to the interests of the trade.

Possible Improvements in Wool Manufacturing

Few, if any, departments of human endeavor present more striking evidence of low efficiency than does the work of the inventor. Recently the patents issued by the United States reached the 1,000,000 mark. On December 12 the number had risen to 1,011,894, and this is being increased at the rate of approximately 600 a week. Yet how few of the number amount to anything. By far the greater number are worthless, representing an untold loss of labor and capital expended in experiments. And the published record of the patent office represents but a small part of this loss. Many applicants are rejected, while many other attempts at invention never reach the stage of application for patent. Much of the loss represented by these failures is due to misdirected effort, to the inventing of appliances and process which would be of trifling importance even if successful. For this reason directing the energies of inventors to really useful fields is of really great importance, not only to the inventors, but to society. An interesting effort in this direction has been made by Frank W. Reynolds, of the firm of Lockwood, Greene & Co., in a paper read before the American Society of Mechanical Engineers. Mr. Reynolds points out what he considers the more important problems and difficulties the solution of which seems to depend on the mechanical engineer. While the entire paper deserves careful study, the following extract, dealing with wool manufacturing, contains a particularly large number of valuable suggestions for textile inventors and engineers:

There are many problems that are more or less peculiar to woolen and worsted mills. Some of the more important of these are here noted.

Machinery offers a great field for improvement. One of the greatest present wastes comes in the extremely short life of the leather aprons and dabbing brushes on worsted combs. The annual cost of renewals of the leather apron which carries the stock to the combs in a large mill may easily exceed $10,000. Metal rolls have been tried as a substitute for the leather apron, but without success. The problem is as old as the industry and it would seem that a solution should be forthcoming. The ineffectiveness of many devices tried in the past raises the question whether an entirely different type of machine is not needed. Dabbing brushes often wear out in about two days, and apart from the expense of the new brushes themselves, the bother of the whole operation is a great nuisance. Something new is needed here, possibly something new in principle.

The French system of spinning raises another serious problem in the difficulty of getting the right conditions for the best handling of the fiber. There is much electricity. Proper conditioning of the air for the fiber demands both high temperature and high humidity. The crux of the whole difficulty seems to be in the heating of the rolls of the machine, the temperature of which is the most important single item in successful spinning. They must have the same temperature as the air of the room; if they are only a little cooler spinning goes badly, while if they are comparatively cold, spinning is practically out of the question. The problem here is whether the roll can be heated to an efficiency temperature by some internal application of heat, so that its temperature shall be practically independent of the air.

A variety of other problems may be grouped together, not because they are individually unimportant, but because there is no need of enlarging upon them after what has already been said in more detail of the problems of the cotton mill. Dust in the singe-room is one of these problems. This dust falls to the floor and can be cleared away with an air blast or air suction rather more easily than the cotton lint; but some kind of continuous removing process is necessary because of the extremely irritating effect of this dust when breathed into the lungs. Sulphur dioxide gases in the bleachery offer another problem in removal; a somewhat similar problem arises also in the carbonizing room where the treatment of wool with acids gives rise to very destructive action upon shafting and wood work. Ventilation of hot rooms and dye houses is another removal problem. These air-borne by-products of the woolen industry, comprising as they do, steam, various destructive gases, dust, an excess of heat and humidity, might seem again to furnish material for a special branch of engineering. Proper utilization of the waste products from wool washing presents another opportunity for the engineer.

In regard to the machinery, there is at present much trouble from soiling of fabrics by the oil used on the machines through which they pass, especially in the finishing machines. Such stains are of course disastrous on white or light-colored

goods and are more serious than similar stains on cotton fabrics because of the much greater value of the material itself. There seems to be in the woolen manufacture the same question that arises in respect to cotton, whether the whole machinery of manufacture cannot in some way be made to give more output and better product by some departure from traditional methods. Existing processes leave something to be desired, not only on the side of their producing efficiency and maintenance cost, but perhaps quite as much in the deterioration of the wool fiber that results from existing processes.

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The National Wool Growers' Association

The annual meeting of this association was held at Omaha last month, with the revision of Schedule K as the chief subject of the discussion. The meeting indorsed a specific tariff based on the secured weight of wool. The overwhelming sentiment of the meeting was in opposition to specific duties on grease wool and ad valorem duties on any kind of wool. The association at the Portland meeting last January came out strongly in support of the existing Schedule K with its specific duties on wool and by-products. The change in eleven months from approval to opposition is due to the argument presented by State Senator Blume, of Wyoming, who read a paper at Portland that was published in our January, 1911, issue. Senator Blume argued that, as the wool imported shrunk only 40 per cent. in scouring, the actual protection to the American wool grower was not the nominal 33 cents per pound imposed on scoured wool, but was only 18 1/3 cents (.11 ÷ .60), the scoured equivalent of the 11 cent rate on grease wool. Now, he argued, as Western wool shrinks about 66 2/3 per cent., this 18 1/3 cents per scoured pound is equivalent to a protection of only 6 1/9 cents (.18 1/3 × .33 1/3) per unscoured pound of Western wool.

This little arithmetical calculation immediately caught the imagination of the Western wool growers, the result being the passage of the following resolutions at the Omaha meeting, and the raising of a fund of $38,000 for carrying on a campaign in behalf of the new proposition at Washington:

Resolved, Inasmuch as the wool trade of the world is satisfactorily conducted in valuing wool upon the scoured basis, we believe it affords the most equitable and satisfactory plan of levying duties. If it is possible to buy and sell wool in this way we can see no reason why the government cannot levy and collect its import duties upon the same basis.

Resolved, That we are unalterably opposed to the levying of a duty based on the grease basis under present conditions as applied in the Payne law and we are arrayed equally against any collection of duties based on the ad valorem system.

Resolved, That we endorse unqualifiedly the specific scoured pound basis as the only scientific equitable and permanent basis on which import duties on wool can be collected and we favor fair compensatory and protective duties on the manufactures of wool.

Resolved, That we request that the Department of Agriculture extend its activities into the field of wool and institute a technical wool college in connection with the experiments now being carried on with sheep, and that we further ask that the Secretary of Agriculture shall establish a wool department at various agricultural colleges in different States.

Resolved, That we condemn the practice among woolgrowers of allowing tags or foreign substances to be packed with their fleeces when shorn, also the practice of using sisal or other injurious twines and the improper dyeing of fleeces.

Resolved, That the president and executive committee be and are hereby authorized and empowered to take up this matter with wool dealers and manufacturers with a view of determining a proper premium to be paid for wools sold by flockmasters who have properly prepared their product for the market.

Resolved, That the general impression prevailing throughout the public press and in the midst of the consumer is that the producer of wool and mutton is driving an unjust toll from the consumer of these products.

Resolved, That we hereby demand that the Secretary of Commerce and Labor make an investigation of the facts in the case and submit to Congress a statement showing the distribution of costs in both wool and mutton from the time it leaves the hands of the producer until it is purchased by the consumer.

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Passementarie Congress

Arrangements are being made for a congress of passementarie manufacturers to be held at Annaberg, Germany, next year. The program includes the exhibition of passementarie machinery and products. The leading firms in this industry have signified their intention to take part and ample funds have been provided, the city of Annaberg having made a large contribution.

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In 1909 India produced about 4,500,000 bales of cotton, nearly one-half of which was consumed by the Indian mills.

The Tariff Board's Report on Schedule K.

Following are the leading points in the synopsis of the Tariff Board's report on Schedule K and in the President's message accompanying the report:

Specific rates on wool exclude wools of high shrinkage.

An ad valorem duty would overcome the discrimination of the specific tariff on wool.

Ad valorem duties are objectionable because of danger of undervaluation and difficulty of administration.

A specific duty based on the scoured weight of wool would obviate the chief evil of present system.

There is no good reason for present discrimination between class 1 and class 2 wools.

Heavy shrinkage wools, if imported, would displace cheap substitutes.

Cost of wool production cannot be stated categorically.

Duty on scoured wool is prohibitive.

Duties on noils, wastes and shoddy are prohibitive.

Duties on tops and on low and medium grade yarn and cloth are prohibitive.

Tariff on yarn can be graduated according to yarn count.

Domestic prices are not raised to full amount of tariff.

Prohibitive duties form temptation to monoply and conspiracies to control prices.

American manufacturer has no advantage in efficiency over his foreign competitor.

Cost of manufacturing is much higher here than abroad, being double the English cost.

Purely specific duties on wool fabrics cannot be made equitable.

Purely ad valorem duties on wool fabrics cannot be made to work fairly and effectively.

Duties on wool goods should be compound, both specific and ad valorem rates being graduated according to value.

The President's message is in part as follows:

In my message of Aug. 17, 1911, accompanying the veto of the wool bill, I said that, in my judgment, Schedule K should be revised and the rates reduced. My veto was based on the ground that, since the Tariff Board would make in December, a detailed report on wool and wool manufactures, with special reference to the relation of the existing rates of duties to relative costs here and abroad, public policy and a fair regard to the interests of the producers and the manufacturers on the one hand and of the consumers on the other demanded that legislation should not be hastily enacted in the absence of such information; that I was not myself possessed at that time of adequate knowledge of the facts to determine whether or not the proposed act was in accord with my pledge to support a fair and reasonable protective policy; that such legislation might prove only temporary and inflict upon a great industry the evils of continued uncertainty.

The report shows that the present method of assessing the duty on raw wool—that is, by a specific rate on the grease pound (i. e., unscoured)—operates to exclude wools of high shrinkage in scouring, but fine quality from the American market and thereby lessens the range of wools available to the domestic manufacturer; that the duty on scoured wool of 33 cents per pound is prohibitory and operates to exclude the importation of clean, low-priced foreign wools of inferior grades, which are nevertheless valuable material for manufacturing, and which cannot be imported in the grease because of their heavy shrinkage. Such wools, if imported, might be used to displace the cheap substitutes now in use.

These discriminations could be overcome by assessing a duty in ad valorem terms, but this method is open to the objection, first, that it increases administrative difficulties and tends to decrease revenue through undervaluation; and second, that at prices advance, the ad valorem rate increases the duty per pound at the time when the consumer most needs relief and the producer can best stand competition; while if prices decline the duty is decreased at the time when the consumer is least burdened by the price and the producer most needs protection.

Another method of meeting the difficulty of taxing the grease pound is to assess a specific duty on grease wool in terms of its scoured content. This obviates the chief evil of the present system, namely, the discrimination due to different shrinkages, and thereby tends greatly to equalize the duty. The board reports that this method is feasible in practice and could be administered without great expense. The scoured content of the wool is the basis on which users of wool make their calculations, and a duty of this kind would fit the usages of the trade. One effect of this method of assessment would be that, regardless of the rate of duty, there would be an increase in the supply and variety of wool by making available to the American market wools of both low and fine quality now excluded.

The duties on many classes of wool manufacture are prohibitory and greatly in excess of the difference in cost of production here and abroad.

This is true of tops, of yarns (with the exception of worsted yarns of a very high grade), and of low and medium grade cloth of heavy weight.

On tops up to 52 cents a pound in value, and on yarns of 65 cents in value, the rate is 100 per cent. with correspondingly higher rates for lower values. On cheap and medium grade cloths, the existing rates frequently run to 150 per cent. and on some cheap goods to over 200 per cent. This is largely due to that part of the duty which is levied ostensibly to compensate the manufacturer for the enhanced cost of his raw material due to the duty on wool. As a matter of fact, this compensatory duty, for numerous classes of goods, is much in excess of the amount needed for strict compensation.

THOMAS W. PAGE. ALVIN H. SANDERS. HENRY C. EMERY, CHAIRMAN. JAMES B. REYNOLDS. WILLIAM M. HOWARD.

THE TARIFF BOARD.

The report shows in detail the difficulties involved in attempting to state in categorical terms the cost of wool production and the great differences in cost as between different regions and different types of wool. It is found, however, that, taking all varieties in account, the average cost of production for the whole American clip is higher than the cost in the chief competing country by an amount somewhat less than the present duty.

The report shows that the duties on noils, wool wastes, and shoddy, which are adjusted to the rate of 33 cents on scoured wool, are prohibitory in the same measure that the duty on scoured wool is prohibitory. In general, they are assessed at rates as high as, or higher than, the duties paid on the clean content of wools actually imported. They should be reduced and so adjusted to the rate on wool as to bear their proper proportion to the real rate levied on the actual wool imports.

On the other hand, the findings show that the duties which run to such high ad valorem equivalents are prohibitory, since the goods are not imported, but that the prices of domestic fabrics are not raised by the full amount of duty. On a set of 1-yard samples of 16 English fabrics, which are completely excluded by the present tariff rates, it was found that the total foreign value was $41.84; the duties which would have been assessed had these fabrics been imported, $76.90; the foreign value plus the amount of the duty, $118.74; or a nominal duty of 183 per cent. In fact, however, practically identical fabrics of domestic make sold at the same time at $69.75, showing an enhanced price over the foreign market value of but 67 per cent.

Although these duties do not increase prices of

domestic goods by anything like their full amount, it is none the less true that such prohibitive duties eliminate the possibility of foreign competition, even in time of scarcity; that they form a temptation to monopoly and conspiracies to control domestic prices; that they are much in excess of the difference in cost of production here and abroad, and that they should be reduced to a point which accords with this principle.

The findings of the board show that in this industry the actual manufacturing cost, aside from the question of the price of materials, is much higher in this country than it is abroad; that in the making of yarn and cloth the domestic woolen or worsted manufacturer has in general no advantage in the form of superior machinery or more efficient labor to offset the higher wages paid in this country. The findings show that the cost of turning wool into yarn in this country is about double that in the leading competing country, and that the cost of turning yarn into cloth is somewhat more than double. Under the protective policy a great industry, involving the welfare of hundreds of thousands of people, has been established despite these handicaps.

The Tariff Board reports that no equitable method has been found to levy purely specific duties on woolen and worsted fabrics and that, excepting for a compensatory duty, the rate must be ad valorem on such manufactures. It is important to realize, however, that no flat ad valorem rate on such fabrics can be made to work fairly and effectively. Any single rate which is high enough to equalize the difference in manufacturing cost at home and abroad on highly finished goods involving such labor would be prohibitory on cheaper goods, in which the labor cost is a smaller proportion of the total value. Conversely, a rate only adequate to equalize this difference on cheaper goods would remove protection from the fine-goods manufacture, the increase in which has been ne of the striking features of the trade's development in recent years. I therefore recommend that in any revision the importance of a graduated scale of ad valorem duties on cloths be carefully considered and applied.

I venture to say that no legislative body has ever had presented to it a more complete and exhaustive report than this on so difficult and complicated a subject as the relative costs of wool and woolens the world over. It is a monument to the thoroughness, industry, impartiality and accuracy of the men engaged in its making. They were chosen from both political parties, but have allowed no partisan spirit to prompt or control their inquiries. They are unanimous in their findings. I feel sure that after the report has been printed and studied the value of such a compendium of exact knowledge in respect to this schedule of the tariff will convince all of the wisdom of making such a board permanent in order that it may treat each schedule of the tariff as it has treated this, and then keep its bureau of information up to date with current changes in the economic world.

It is no part of the function of the Tariff Board to propose rates of duty. Their function is merely to present findings of fact on which rates of duty may be fairly determined in the light of adequate knowledge in accord with the economic policy to be followed. This is what the present report does.

The findings of fact by the board show ample reason for the revision downward of Schedule K, in accord with the protective principle, and present the data as to relative costs and prices from which may be determined what rates will fairly equalize the difference in production costs. I recommend that such revision be proceeded with at once.

Wm. H. Taft.

The White House, Dec. 20, 1911.

Following is the principal portion of the synopsis of the Tariff Board's report:

WOOL COSTS

The result of the raw-wool investigation establishes the fact that it costs more to grow wool in the United States than in any other country; that the merino wools required in such great volume by our mills are the most expensive of all wools produced; that the highest average cost of production of such wool in the world is in the State of Ohio and contiguous territory; and that the lowest average cost on similar wool is in Australia.

It is not possible to state in exact terms the actual cost of producing a pound of wool considered by itself, for the simple reason that wool is but one of two products of the same operation; that is to say, flocks produce both fleeces and mutton—products entirely dissimilar in character and yet produced as the result of the same expenditure for forage and for labor. The only practical method, therefore, of arriving at the approximate cost of the wool is to treat fleeces as the sole product and charge up against their production the entire receipts from other sources. This method gives an accurate result so far as the profits or losses on flock maintenance are concerned; results which are comparable as between various sheep-growing regions.

Figured in this manner the board finds:

That after crediting the flock with receipts from all sources other than wool, the latter product, in the case of the fine merino wools of the United States, is going to market with an average charge against it of not less than 12 cents per pound, not including interest on the investment.

That the fine wools of the Ohio region are sold bearing an average charge for production of 19 cents per pound.

That in the States east of the Missouri River wool production is incidental to general farming. Here producers, with the exception of certain named districts, lay more stress upon the output of the mutton than of wool, and in such cases the receipts from the sale of sheep and lambs ordinarily cover the flock expense, leaving the wool for profit. The position of the fine-wool producers, however, not only of the Ohio region, but of the far West, is radically different.

That in the western part of the United States, where about two-thirds of the sheep of the country are to be found, the "fine" and "fine medium"

wools carry an average charge of at least 11 cents per pound, interest not included.

That if account is taken of the entire wool production of the country, including both fine and coarse wools, the average charge against the clip is about 9 1/2 cents per pound.

That in South America the corresponding charge is between 4 and 5 cents per pound.

That in New Zealand and on the favorably situated runs of Australia it seems clear that at the present range of values for stock sheep and mutton the receipts from other sources than wool are carrying the total flock expense. So that taking Australasia as a whole it appears that a charge of a very few cents per pound lies against the great clips of that region in the aggregate. While the board cannot therefore undertake to name an exact figure in that case, it is certain that the Australasian costs at large fall materially below the South American.

That in the western United States the capitalization per head of sheep (exclusive of land) is $5.30, upon which a gross profit of 6.2 per cent. was realized. The interest rate in that region ranges from 8 to 10 per cent. per annum.

That the labor, forage, and necessary miscellaneous expense in the western United States exceed $2 per head per annum as against an estimated cost, covering the same elements of expense, of less than $1 in Australia and about $1.15 per head in South America.

WOOL DUTIES

The board finds that the present method of levying duties upon raw wool is defective in that it operates, by reason of the varying shrinkages of the different kinds of wool, to prevent the importation of many heavy-conditioned sorts which if imported would add substantially to the stock of sound staple available for the manufacture of woolen fabrics.

That there is no valid reason for the discrimination that now exists as between the wools of Class I (merino and crossbred) and Class II (English, medium and luster), and that these two classes could properly be consolidated.

That the present duty of 33 cents per pound on scoured wool is prohibitive, preventing effectually the importation of clean, low-priced foreign wools of the lower grades that would be exceedingly useful in the manufacture of woolens in this country, and if so used might displace in large measure the cheap substitutes now so frequently employed in that industry. The fact that such cheap wools are of such heavy shrinkage that they cannot be imported in an unscoured state emphasizes all the more the prohibitive character of the present scoured pound duty.

That an ad valorem rate is open to grave difficulties from the point of view of administration and revenue, in the case of a crude, bulky commodity like wool, produced in many remote regions and finding its way into the markets through so many various channels of trade.

That, furthermore, an ad valorem rate would give a high duty per pound when prices are high—that is, when the consumer most needs relief and the produced is most able to bear competition. With a low price of wool the duty per pound would be low—that is, at the time when the consumer has less need of competing wools and the producer is least able to bear competition.

That the chief objections to the present rate on the grease pound could be met by levying some form of specific duty based on the clean or scoured content of the wool imported.

That the necessary machinery for testing at ports of entry could be installed promtly and cheaply and could be maintained efficiently at small expense.

SHRINKAGES

The rates of Schedule K are based upon the assumption that wools in the grease shrink an average of 66 2/3 per cent. While it is true that considerable quantities of wool do shrink that amount, the average is well below that figure. Certain very heavy wools grown at the South African Cape and in certain districts of Australia, South America, and the Western United States shrink as high as 70 to 75 per cent.

From actual examination of domestic mill records it is found that the average shrinkage of the fine merino wools now being imported into the United States from Australia and South America is about 48 per cent.

Similar wools from the same countries finding their way to European markets shrink considerably more, which fact reflects the exclusion of the heavier conditioned wools from our markets.

That the average shrinkage of our fine western wools is 67 per cent., the average shrinkage for all the wools of that region being 62 per cent.

That the average shrinkage of Ohio and other fine domestic fleeces is 60 per cent.

That the average shrinkage of the lower grade domestic sorts is about 45 per cent.

That the national average shrinkage would fall between 55 per cent. and 60 per cent.

That South American crossbred wools now being imported shrink an average of about 33 per cent. and the Australian crossbreds about 30 per cent.

That the Class II (English washed) wools shrink, as a rule, from 18 to 30 per cent.

In this connection it should be borne in mind that the merino and crossbred fleeces now entering our market have been, as a rule, "skirted" or trimmed before shipment, so that their yield of clean wool is higher than would otherwise be the case.

NOILS AND WASTES

Practically no wool wastes or shoddy are imported under the present rates, which are, in effect, prohibitory. The same duties are applied to wastes of an entirely different character. No comparison as to the cost of production of such products can be made. Noils and wastes are merely by-products of the worsted industry and their values bear, in the main, a certain definite relation to the value of the scoured wool from which they come. The present duties on these products are, in theory, adjusted to the actual rates of duty paid on the scoured content of the wools imported, but are not so adjusted in fact.

For example, the duty on soft wastes is nearly half as high again as the duties levied on the scoured content of wools actually imported under

present conditions, and the rate of duty on noils is practically equal to the rate of duty actually paid on the scoured content of imported wool.

RAGS AND SHODDY

The duties on rags and shoddy are practically prohibitory. The duty on shoddy bears no relation to the cost of manufacture. A much lower duty would equalize the difference in cost of production to the shoddy manufacturer. Shoddy, however, competes with wool and the duty acts as protection to the woolgrower. Although all shoddies except the very finest are of much less value than scoured wool, the present duty is higher than the duty on the scoured content of the wool actually imported. On the other hand, woolen rags are exported very largely from the United States and American shoddy is imported into Great Britain in considerable quantities.

WOOL MANUFACTURES

The present duty practically excludes tops from importation and all yarns except worsted yarns of the greatest fineness and value. The same is true of low-grade and medium cloth for men's wear, with the possible exception of very light weight goods. A considerable quantity of the fine and expensive fabrics are imported. In the fiscal year 1911 these paid a duty amounting to 94.17 per cent. ad valorem. These did not constitute 3 per cent. of the total consumption of the United States. Women's dress goods weighing 4 ounces or under per yard are still imported in large quantities, and these paid in 1911 an average duty of 102 per cent.

On fabrics there are two duties—a specific duty levied on weight and an ad valorem duty. The specific duty theoretically compensates the manufacturer for the extra cost of his raw material due to the duty on wool. This compensatory duty is fixed at a point intended to be adequate to compensate the manufacturer using nothing but foreign wool of 66 2/3 per cent. shrinkage. Practically no wool of such heavy shrinkage is imported under the present tariff duty. Consequently, the specific duty is more than compensatory for manufacturers using wools of lighter shrinkage.

This is true to a much greater extent in the case of fabrics made partly or wholly of shoddy, wool wastes, and cotton. An attempt to adjust the compensatory duty to the character of the material used in the fabric is made by the present tariff act, which fixes the compensatory duty at 33 cents a pound for goods worth not more than 40 cents a yard as against 44 cents per pound for goods worth more than 40 cents a yard. The lower rate, however, for the cheaper goods is equally in excess of the actual compensation needed as is the higher rate on medium goods. The result is that on low-grade goods a specific duty of 33 or 44 cents is sometimes in excess of the total value of the raw material in this country. Consequently the nominal duty on certain cheap fabrics, if imported—which is impossible under the existing duty—is commonly as high as 150 per cent. ad valorem, and in some cases even over 200 per cent.

Much of the objection to the present compensatory duty as giving excessive compensation would be removed by putting the duty on wool on the scoured basis instead of on the grease pound. The compensatory duty in that case could be adjusted to the actual wool content in the case of all-wool goods, at least, and would be entirely independent of the disputed point of grease-wool shrinkages. As in the present act, it could be made proportionately lower for goods containing other materials than wool, by means of a separation according to value.

On cheap and medium grades of cloth for men's and women's wear, excepting light-weight dress goods, the combined specific and ad valorem duties are much in excess of the difference in the cost of production here and abroad.

RELATIVE PRICES

On the other hand, prices in this country on the fabrics just referred to are not increased by the full amount of the duty. A collection of representative samples was made in England of goods ranging from those which cannot be imported at all to those which are imported continually. These were then matched with a collection of samples of American-made cloths which were fairly comparable, and the mill prices compared for the same date. It is found that on goods entirely excluded the nominal rates of duty would reach an ad valorem rate of 150 or even over 200 per cent., but that the American fabric is actually sold in the market at from only 60 to 80 per cent. higher than similar goods sold abroad.

On the 16 samples of foreign goods, for instance, none of which is imported, the figures are as follows:

Total of foreign prices	$41.84
Duties which would have been assessed had they been imported	76.90
Foreign price, plus the duty, if imported	118.80
Actual domestic price of similar fabrics	69.75

Thus, though the nominal duties on such fabrics are 184 per cent., the actual excess of the domestic price over the foreign price on similar fabrics of this kind is about 67 per cent. This is the result of domestic competition. At the present time the industry in general is on a competitive basis.

Certain specialties may be produced in limited quantities by particular firms which cannot be duplicated successfully by their competitors. This might be the result of secret processes or of some special skill in designing or finishing. This may mean a wide margin of profit per unit of product in individual cases. It should also be noted that even in the case of standard goods the industry is one peculiarly dependent on fashion, and the manufacturer who happens to succeed in anticipating the shifting public demand may sell his goods upon a wide margin over the cost of manufacture and make large profits. Under ordinary circumstances the average manufacturer will find that he can sell a part of his output with a good margin of profit, and that another part, which does not meet the public demand, will have to be sold close to the cost price, or even below.

As to the productive capacity of the country in cloth making to meet the domestic demand, there

is at the present time no indication of any lack of adequate equipment. It is true that some years ago a greatly increased demand for worsted fabrics, assisted by the high tariff on worsted goods and their by-products, made the manufacture of such goods very profitable and the investment alluring, but this led to a rapid increase of worsted machinery in this country and the building of great modern mills in rapid succession in various parts of the East. A very considerable part of this increase was due to the inflow of foreign capital and the transfer of experienced cloth manufacturers from other countries. The result has been a great increase in competition.

RELATIVE COSTS

The cost of manufacturing woolen and worsted yarns and cloth in the United States is much higher than in Europe. The main elements of cost of production are cost of plant, material and labor.

The cost of erecting and equipping both woolen and worsted mills is much higher in this country than in England. The cost of erecting and equipping a woolen mill is about 45 per cent. greater. The same is true of the weaving department of a worsted mill using American machinery.

The excess in cost in the case of worsted spinning is greater, as most of the machinery is imported. This pays a duty of 45 per cent. ad valorem, and to this must be added charges for packing, freight, etc., which makes the foreign machine cost 70 per cent. more or over in this country than abroad. Nor does this include the cost of erection, as does the price to the English manufacturer. The same is true of weaving machinery when imported.

The material is increased in price by the duty on raw wool. The manufacturer who imports his wool must pay the full amount of the duty, and this means either additional working capital or an additional interest charge to be paid. Wool grown in the United States are increased in value by the duty, but not by the full extent of the duty.

Wages are much higher in the United States, but wages are, in themselves, no necessary indication of relative cost of production. Frequently it is found that high wages and low labor costs go together. The question at once arises whether the labor in American woolen and worsted manufacturing is more efficient than such labor abroad, or whether by more efficient management or greater speed in machinery the American manufacturer is able to get a larger product per operative in proportion to the difference in wages.

It appears that this particular industry is one in which the high elements of costs in this country are not in general offset by any particular advantage or by any marked superiority in the efficiency of labor. To a certain extent, European countries have the advantage of us in this latter regard. In the centers of the industry abroad there is an adequate supply of labor which has been trained for generations in this one industry. In the United States a considerable portion of the labor is found to be of unskilled immigrants with no previous experience in manufacture; and in certain centers this population is of a very fluctuating kind, and the manufacturer is obliged continually to break in a new set of inexperienced operatives. The American tendency to secure the maximum output is noticeable in some cases, but comparing this country with England, at least, it may be said that the possibilities of speed have been practically reached in the latter country.

So far as worsted spinning is concerned, the best mills in this country seem to be able to operate with fewer operatives per machine, and to get a greater product per operative, than in some European countries, but if this means a sacrifice of quality of product to output it is not really a decrease in cost. Looms in the Bradford district run, on the whole, at a higher rate of speed than do looms in the United States. Furthermore, there is no superiority in American machinery over foreign machinery. As a matter of fact, a large amount of foreign machinery is used in this country, and in the worsted mills covered by the investigation into machine efficiency 87 per cent. of all the machinery, from the scouring of raw wool through to the finished yarn, was imported. Only 22.9 per cent. of looms were imported.

It may be said, then, that, taking the industry as a whole, the American manufacturer practically has no advantage in efficiency of labor and equipment over his foreign competitor, although this statement is subject to exceptions in the case of particular processes at particular mills. On certain specialties the largest and most efficient American mills are able by skillful organization materially to reduce the difference in cost.

TOPS

The difference in the cost of turning wool into tops in this country and England varies with the quality of the top. Considering all grades it may be stated that 80 per cent. presents a rough approximation of the excess of the American cost over the English. The charges for commission combing in the two countries vary by about 60 per cent. The reason for the divergence of the cost figures from the commission charges is explained in the report.

This, of course, does not mean 80 per cent. of the value of the tops, but merely 80 per cent. of the conversion cost. The cost of conversion in the case of tops is in any case but a few cents, and but a small fraction of the total value of the product, including material.

WORSTED YARNS

The cost of producing yarns varies in different countries according to particular qualities and methods. In England the method of frame spinning is the more common, and on the Continent mule spinning. The latter is the more expensive process. Comparing frame spinning in England with frame spinning in the United States—which is the common method here—it may be said that, although there are wide variations in both countries from mill to mill, the conversion cost for the same quality and count of yarns in the United States is about twice that in England. The difference in the cost between the United States and

Germany is not so great. This refers to the mere cost of turning tops into yarn, and of course does not mean that the difference in cost is equal to 100 per cent. of the foreign selling value. The foreign conversion cost of yarn from tops except in the case of the finest yarns, is normally less than 20 per cent. of the total market value of the yarn. Care should be taken not to confuse the ratio between manufacturing costs and the ratio between total values, including cost of raw material.

RELATIVE COST OF PRODUCING CLOTH FROM YARN

The difference in manufacturing cost here and abroad of woolen and worsted fabrics varies greatly, according to the character of the fabrics. The main processes included are weaving, finishing, and dyeing. The figures of the board show that the cost of turning yarn into cloth in the United States compared with England is all the way from 60 per cent. to 170 per cent. higher, according to the character of the fabric. For a great variety of fabrics the American conversion cost is from 100 to 150 per cent. greater than the English cost. This is further substantiated by the fact that the weaving scales per yard of product in the two countries vary in almost exactly the same proportions. The difference in cost of manufacturing in France and the United States is found to be very close to the difference between England and the United States. On the other hand, the difference in the cost of manufacture in the United States and Germany is somewhat less. Further, it should be pointed out that the statement that the difference in the cost of manufacturing cloth is 100 per cent. or more does not mean 100 per cent. of the market value of the cloth. It merely means that, given the same yarn, the cost of weaving and finishing in this country is generally somewhat more than double that in England. It is impossible to express this difference in relation to the total value of the product, since the material going into two different articles having the same conversion cost may vary widely in value, while, on the other hand, the material for the production of exactly the same article may vary widely in value at two different periods and the conversion cost remain exactly the same.

METHOD OF ASSESSING DUTIES

If an ad valorem duty be placed upon raw wool, the duties on manufactures of wool must necessarily be ad valorem duties. If a specific duty should be placed on the scoured content of the raw wool, it would then be possible to levy a specific duty on tops and yarns. The system of specific duties, as is well known, has many advantages for administrative and revenue purposes. It has a further advantage from the point of view of adjusting duties to difference in cost of production at home and abroad. If this policy is to be pursued, the duty can be maintained at a constant and definite figure corresponding to a definite and constant difference in cost of manufacture. Under an ad valorem system the amount of duty varies with every fluctuation in the market value of the raw material, while the difference in the cost of manufacture remains relatively constant. In the case of yarns, which are fairly well standardized, and where the cost varies in a fairly definite relation to the fineness of the spinning, a scale of specific duties graduated to the different sizes of yarn could be readily arranged and administered.

On the other hand, it is probably impracticable to adopt a purely specific system of duties on woven fabrics. These are not standardized in any way and vary widely in material, in construction, and in conversion costs. No feasible scheme of classifying and describing fabrics in terms corresponding to differences in conversion cost has yet been worked out. Consequently, even if the specific system of duties were adopted for wool and yarn it would be necessary to combine a specific compensatory duty with an ad valorem rate for woven fabrics. There are grave difficulties, however, in attempting to place a flat ad valorem rate on manufactures of this kind. In certain grades of fabrics the value of the material is a very large proportion of the total value and the cost of manufacture relatively small. In the case of expensive and finely finished goods, on the other hand, the cost of material becomes less important and the labor or conversion cost becomes an increasingly large proportion of the cost. The result is that a flat rate adequate to offset the difference in cost of production on the finer goods must be prohibitive on cheaper goods. Conversely, the rate which merely equalizes the difference in cost of production on cheaper goods would be inadequate to equalize the difference in the cost of finer goods. A fair solution seems to be the adoption of a graduated scale under which the ad valorem rate assessed properly on goods of low value should then increase progressively, according to slight increments of value, up to whatever maximum rate should be fixed.

A single specific compensatory duty, if adequate for all-wool goods made from imported wool, would be excessive for low-grade goods containing cheaper materials. This could be partly offset by a lower ad valorem rate on such goods. Specific compensatory duties could be assessed at two or more rates, according to value.

READY-MADE CLOTHING

The investigation into the ready-made clothing industry shows that the cloth is the largest single element in the clothing produced and is equal to one-third of the net wholesale selling price. It varies with the grade of clothing produced, being highest relatively in the cheaper garments. The cost of linings is about 5 per cent. of the net wholesale selling price. The total cost of cloth and woolen materials, taken as a whole, is equal to about 40 per cent. of this price.

In considering the importance of cloth cost to the wearer of clothing it is necessary to bear in mind the margin between wholesale and retail price. The retail price is usually 50 per cent. or more above the net wholesale price. On this basis about 25 per cent. of the price paid to the retailer goes to the manufacturer of cloth.

Taking the industry as a whole, the cost of material, labor, and all other expense undergone

in converting material into finished garments is 80 per cent. of the net wholesale selling price of the finished product. Out of this 20 per cent. margin between the total manufacturing cost and the manufacturer's net selling price come selling expense, such general expense as cannot be charged directly to manufacturing or selling, and ing expenses are considerably lower for these establishments.

There is submitted a detailed statement for an actual standard high-grade suit of all-wool cloth, which traces the relation of costs and prices in detail for each process of production from the retail price to the cost of the wool on the farm.

	Coat.	Pants.	Vest.
Cost of cloth	$2.39	$1.793	$0.597
Cost of trimmings	1.963	.278	.527
Total	4.353	2.071	1.124
Credit waste	.024	.018	.006
Total cost of stock	4.329	2.053	1.118
Add freight	.025	.019	.006
Total	4.354	2.072	1.124

CONVERSION COST.

	Coat.	Pants.	Vest.	Suit.
Sponging and examining	$0.040	$0.030	$0.010	$0.080
Cutting	.146	.109	.037	.292
Trimming	.034	.025	.008	.067
Fitting	.055	.040	.030	.095
Operating	.380	.255	.188	.823
Basting	.318	.035	.060	.413
Finishing	.345	.138	.027	.510
Button sewing	.037	.040	.023	.100
Buttonholes	.130	.....	.107	.237
Pressing	.450	.150	.123	.723
Bushcling	.068	.050	.025	.143
Miscellaneous	.210	.008	.005	.223
Examining finished product	.017	.013	.004	.034
Total manufacturing labor	2.230	.863	.647	3.740

SUMMARY.

Total stock cost	$1.354	$2.072	$1.124	$7.550
Conversion cost	2.230	.863	.647	3.740
General expense distributed to each garment on basis of manufacturing labor in each garment	.669	.259	.194	1.122
Total factory cost	7.253	3.194	1.965	12.412
Selling expense distributed to each garment on basis of ratio of total selling expense to total value of output	.....	.....	.....	1.908
Final cost (factory cost plus selling expense)	.....	.....	.....	14.320

profit. These figures apply particularly to men's clothing, where garments are more standardized and represent costs more easy to secure.

In women's garments the cloth is also the largest single item. In skirts it is equal to 40 per cent. of the net wholesale selling price; on most coats equal to between 30 and 35 per cent.; on cheap suits it is over 25 per cent.; and on more expensive varieties it falls below 20 per cent. To the manufacturer, therefore, cloth is not so important an element of cost in women's clothing as in men's. On the other hand, the labor and manufacturing expense are more important in women's clothing. The margin remaining to the manufacturer of women's garments over and above the cost of materials and expense of converting them into wearing apparel is somewhat less than in the men's clothing industry, but sell-

THREE-PIECE SUIT

Regular wholesale price, $16.50; retail price, $23 and up. Cloth, fancy worsted.

COST OF STOCK

Trimmings: Body lining, $0.38 1/4 per yard. Sleeve lining, $0.18 per yard. Number of yards per suit: (a) Coat, 1.8; (b) pants, 1.35; (c) vest, 0.45; total, 3.6.

Cost of cloth used in suit: (a) Per yard, $1.328; (b) total, $4.78.

CLOTH MAKING

Kind of cloth	Fancy worsted suiting
Number of warp ends to 1 inch	73
Number of picks to 1 inch	61
Width in reed	65 1/2
Width of goods finished	57

Weight of cloth per yard (ounces) 11 1/10
Pounds of cloth to 1,000 yards 693 3/4

CONVERSION COST FOR ONE THOUSAND YARDS

Productive or direct labor is the actual labor applied to stock in its conversion, including proportion of wages paid to second hands and subforemen properly chargeable to each department.

Nonproductive or indirect labor is indirect labor employed in department, including overseers, foremen, carriers, etc., but not including general and repair labor, these being provided for under general expense.

Department materials are materials other than stock, used in department; for example, soap for scouring, oil for oiling stock, dyes and chemicals for dyeing, etc.

COST OF STOCK FOR 1,000 YARDS.

	Kind of yarn.	Plain mixed or colored.	Count of yarn.	Pounds.	Cost of yarn per pound.	Total cost.
Warp:						
2,144 ends	One-half blood	Twist	2/40	212	$1.06	$224.72
1,848 ends	do	Colored	2/40	182.7	1.06	193.66
152 ends	Silk	White	60/2	3.4	3.90	13.26
Total ends, 4,144	Waste 2½%			10		10.60
Weft, 61 picks	One-half blood	Twist	2/40	175.5	1.06	186.03
	do	Colored	2/40	175.5	1.06	186.03
	Waste 2½%			8.8		9.33
Total stock				767.9		823.63

As it requires 3.6 yards of cloth to make the suit, the amount of wool in the whole suit would be 9.7 pounds. At a cost of 16 cents per pound, the total cost of raising the wool for this suit would be $1.55. Out of 25 cents per pound, the price paid by the manufacturers, the wool grower would receive $2.23, or a margin of 68 cents. While the average Ohio flock covered by the board's investigation, as reported elsewhere, consists of about 200 sheep, shearing an average of 7.6 pounds of wool, the general flock average of the entire State is but 55, and the general shearing average of the State 6.5 pounds per head. Using this as a basis, it appears that at 23 cents per pound selling price there would be a return of $1.49 1/2 per fleece; the actual cost of which was not less than $1.04, leaving an apparent profit of 45 1/2 cents per fleece. This indicates that the owner of 55 average sheep of shearing age in the average flock would receive $25.02 as the proceeds of a year's maintenance.

	Productive or direct labor.	Nonproductive or indirect labor.	Department materials.	Total cost.
Dressing (including drawing in)	$10.94	$1.56	$6.00	$18.50
Weaving	122.00	38.00	11.20	171.20
Burling	10.00	1.00		11.00
Mending	28.00	1.00		29.00
Remending and specking, etc.	4.50	.50		5.00
Wet finishing	40.00			40.00
Dry finishing and inspecting	14.00	1.00		15.00
General expense, including sample, labor, and material				152.00
Total conversion cost	229.44	43.06	17.20	441.70
Cost of stock				823.63
Net manufacturing cost 1,000 yards				1,265.33

Manufacturing cost per yard $1.265
Selling price per yard ..... net.. 1.328

YARN MAKING—STOCK COST

Spinning 1,000 pounds of worsted yarn No. 2/40:

Pounds tops required for manufacture of 1,000 pounds yarn $1,136.00
Cost of tops per pound ..... .77
Total cost of tops 874.72

COST OF WOOL IN SAMPLE SUIT

It is estimated that the half-blood wool grown in the Ohio region during 1910 carried an average flock expense charge of at least 16 cents a pound. This does not include interest on the investment in the sheep; and all profit above bare production cost of the crops fed to the flock is eliminated. For this wool 23 cents a pound was received by the grower. The cost at the mill was 25 cents a pound. The amount of wool required for each yard of cloth going into this suit is 2.7 pounds.

WAGES AND EFFICIENCY

The investigation as to wages and efficiency, covering 35,029 persons and 164 separate occupa-

tions, shows that the earnings of weavers, based upon actual yardage and piece rates per yard, range from $6 to $18 per week, with an average for worsted weavers of $12.36 for males and $9.54 for females, and for woolen weavers an average of $10.63 for males and $10.54 for females. The weekly earnings are for a week of 55.6 hours, the same as the average hours for the industry in Great Britain.

Of the total of 7,990 scouring, carding, combing, drawing and spinning machines and 12,337 weaving looms investigated, 78 per cent. of all machines excepting looms, and 87.8 per cent. of worsted machinery excepting looms, are of foreign manufacture and 22 per cent. of American make. It is asserted by manufacturers that American-made machines cannot produce the desired results. Seventy-seven and one-tenth per cent. of the looms in use were made in the United States and 22.9 per cent. in foreign countries.

Of the 35,029 employes, 36.5 per cent. were born in the United States and 63.5 in foreign countries. Thirty-five and one-tenth per cent. of all employes were of the newer immigration from Italy, eastern and southeastern Europe. The supervisory class was made up principally of persons born in the United States, the British Isles, and Germany.

Eighty-three and three-tenths per cent. of the

Conversion cost.

	Pounds of material entering each process.	Productive or direct labor.	Nonproductive or indirect labor.	Total cost.
Drawing	1,136	$20.18	$1.62	$21.80
Spinning	1,090	29.31	1.80	31.11
Twisting	1,037	24.54	1.02	25.66
Spooling	1,020	11.37	.75	12.12
Warping on jack spools	1,010	12.51	.75	13.26
General expense				110.08
Total conversion cost		97.91	5.94	213.93
Cost of stock				874.72
				1,088.65
Less credit waste (85 pounds, at $0.37)				31.45
Net manufacturing cost 1,000 pounds				1,057.20

Manufacturing cost per pound, $1.06.

TOP MAKING.

Cost of stock entering manufacture of 1,000 pounds of tops.

	Pounds.	Price per pound.	Total cost.
Raw wool, half-blood Ohio (unwashed)	3,125	$0.25	$781.25
Less credit noils and waste	180	.32	66.10
	50	.17	
Net total			715.15

Conversion cost 1,000 pounds of tops.

	Pounds of material entering each process.	Productive or direct labor.	Nonproductive or indirect labor.	Department materials.	Total cost.
Sorting and blending	3,125				
Scouring	3,125	$7.22	$5.18	$6.56	$18.96
Carding	1,250	3.37	.61		3.98
Combing	1,200	4.88	1.22	2.60	8.70
General expense					23.82
Total conversion cost		15.47	7.01	9.16	55.46
Cost of stock					715.15
Total manufacturing cost 1,000 pounds					770.61

Manufacturing cost per pound, $0.77

total employes had no previous experience in the woolen or other manufacturing or mechanical industry before going to work in the woolen mills. Fifty and nine-tenths per cent. of these had been at school or at home and 32.04 per cent. had been employed in agricultural, transportation, trade, domestic service, and other manufacturing occupations. About one-sixth (16.6 per cent.) had been in the industry less than one year and 53.9 per cent. less than five years.

Eighty per cent. of loom production on worsteds and 70 per cent. on wools, with 20 per cent. of loom stoppages on worsted and 30 per cent. on woolens, while weaving, are the manufacturers' desired standards of efficiency. The individual records kept by the Tariff Board of weavers operating 11,080 looms show that the weavers operating 4.1 per cent. of the worsted looms and 2 per cent. of the woolen looms attained a productive efficiency of 90 per cent. and over. On 24.7 per cent. of worsted and 12.9 of woolen looms the efficiency was 80, but less than 90 per cent. On 30.9 per cent. of worsted and 21.6 per cent. of woolen looms the efficiency was 70, but less than 80 per cent. On 34.1 per cent. of worsted and 45.4 per cent. of woolen looms the efficiency was 50, but less than 70 per cent. On 6.2 per cent. of worsted and 18 per cent. of woolen looms the productive efficiency of the weavers fell below 50 per cent

Seventy per cent. of the weavers were born in the United States, Germany, and the British Isles, and 30 per cent. in Italy, eastern and southeastern Europe. Two menders and burlers were employed for every four weavers and nine looms, to correct the imperfections in the woven cloth. Two and eighteen one-hundredths per cent. of the yardage produced was still imperfect after mending and was sold as seconds.

The productive efficiency per one-man-hour for machine operatives and machines in the scouring, carding, combing, drawing, and spinning departments, with 168 separate labor costs per pound, show wide differences in efficiency and cost, but indicate in general that the lowest labor costs per pound were in mills paying the highest wages.

A PIONEER IN GOOD WORK

Editor Textile World Record:

The writer was interested in the communication from "Wessex" as to weights and measures for cordage and twine, also your reply to same, on page 350 of your December issue. It might be interesting to note that on June 1, 1910, a year before the notice was sent by the jute mills you mention advising selling by net weight, we sent the following notice to our customers:

"All Threads, Twines and Yarns sold by us are guaranteed net weight, all tare deducted," as of June 1, 1910.

This is of interest as showing the pioneer work done along this line and which we note you agree is commendable.

The Linen Thread Co.,
per Lincoln Righter.

THE AMERICAN ASSOCIATION OF WOOLEN AND WORSTED MANUFACTURERS

The annual meeting of this association was held on December 8th, too late for an account of the proceedings to appear in our December issue. The meeting was called to order by President Frederic S. Clark, after which there was a long and animated discussion of the tariff question resulting in the adoption of the following resolution:

Whereas, Since the last annual meeting of this association a bill has been passed by Congress reducing the tariff rates on wool manufactures far below those of the Gorman-Wilson law of 1894-1897 which closed American mills for the benefit of Europe and which was condemned and repealed at the demand of the American people, therefore

Resolved, That if another radical measure is passed by this Congress, failing to maintain a scientific proportion between duties on wool and the duties on finished products, and reasonably protective rates on both, we urge the President again to exercise his prerogative and preserve to this country a manufacturing industry in which $500,000,000 of capital is invested and on which more than a million of our people are dependent for a livelihood.

Several propositions for broadening the work of the association were considered and the following resolution was finally adopted:

Whereas article No. 2 of the constitution of the American Association of Woolen and Worsted Manufacturers provides as follows:

"The object of this association shall be to promote the interests of those persons, firms and corporations engaged in the manufacture and sale of woolen and worsted woven fabrics, to cooperate for the improvement of all conditions relating to the industry."

Resolved, That the board of directors formulate plans for an exchange or sales department, to which department the members of the association shall be requested to send a list of all articles, such as wool, yarn, machinery and any other articles used in the woolen industry, which they may wish to dispose of. On receipt of this information the actuary shall properly classify each article and send a complete catalogue once each month to the members. Any members interested in articles contained in said catalogues shall communicate with the actuary, who shall at once notify them of the name of the member having article or articles for sale.

Members entering articles for sale through the exchange or sales department shall notify the ac-

tuary when a sale has been effected, so that said article can be eliminated from future catalogues. The names of the members offering article for sale, as well as the name of the purchaser shall be retained in confidence by the actuary.

Resolved, That the board of directors be instructed to institute a system whereby members may report to the executive committee through the actuary, unfair and unbusinesslike actions on the part of those from whom they purchase the materials used in this industry; the actuary to ascertain the facts in each case, and prepare and present a concise statement thereof to the executive committee. If after due consideration of any case so presented, the executive committee is satisfied that the member submitting the case is in the right, the actuary to notify the party at fault, and attempt to secure a satisfactory adjustment. Failing in this, the facts to be communicated to the members of the association.

Whereas, Great good having resulted from the concreted effort made, this past spring season, by about one hundred mills, to prevent the misuse of reference samples,—your board of directors strongly recommends that our entire membership join in the movement by sending a uniform letter with all reference samples, stating that they are loaned and that the reference sample of every style not ordered must be returned.

The report of the secretary called attention to the efforts made by the association to establish a uniform standard of shrinkage for wool goods, the result having been the adoption of the following resoluton by the committee of investigation:

"Be it resolved that in order to better acquaint the buyer with the shrinkage of new fabrics shown, the members of the American Association of Woolen & Worsted Manufacturers be recommended to make shrinkage tests of their fabrics, both by steam and cold water processes, and that upon inquiry of the buyer, result of these experiences be furnished him."

The election of officers resulted as follows:

President, Charles Porter, Jr., Charles Porter & Son, Philadelphia; first vice-president, A. M. Patterson, president of the Waterloo (N. Y.) Woolen Manufacturing Co.; second vice-president, Geo. C. Hetzel, of the George C. Hetzel Co., Chester, Pa.; secretary, Herbert E. Peabody, of the Shelbourne Mills, Philadelphia, reelected; treasurer, Richard A. Strong, of Strong, Hewat & Co., North Adams, Mass.

The board of directors, to which three new members were elected, is as follows: Frederic S. Clark, Talbot Mills, North Billerica, Mass.; Thomas H. Wilson, of Thomas H. Wilson, Philadelphia; Ronald L. Whitney, Falls City Woolen Mills. Louisville, Ky.; Frederic W. Freeman, Aetna Mills, Watertown, Mass.; Arthur M. Cox, Richard A. Strong, W. J. Battey, Robert T. Francis, Pontoosuc Woolen Manufacturing Co., Pittsfield, Mass.; George C. Hetzel, A. M. Patterson, Herbert E. Peabody, George B. Waterhouse, Albert L. Gifford, Worumbo Manufacturing Co., Lisbon Falls, Me.; Herman J. Waterhouse, Waterhouse Worsted Mills.

At the afternoon session the following papers were read: Mill Accounting, by F. Gordon Patterson; Manufacturing vs. Merchandising, by Lionel Kremer.

The banquet at the Waldorf-Astoria in the evening was well attended. The speaking began with an address by President Porter. He was followed by Prof. Henry R. Seager, of Columbia University, who spoke on the Workmen's Compensation and Employers' Liability. Abram I. Elkus, attorney for the association, made an interesting address. The speaking was brought to a close by Joseph Smith, of Lowell, Mass., who delivered a witty address on "These Terrible Times."

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THE NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS

A meeting of the board of directors of this association will be held in Philadelphia on January 11, and arrangements then made for the annual convention and exhibition which will be held in the same city on May 6 to 10. In his notice of the meeting Secretary Carter says:

"In view of the unusual conditions now confronting the knitting manufacturers, and the necessity for a more thorough understanding with each other, in an effort to stop the demoralizing competition, and eliminate the abuses which are largely responsible for this state of affairs, it has been decided to call a special meeting of the members of our association, to be held also on January 11th, at 10 A. M., in the Directors' Room of the Manufacturers' Club, Broad and Walnut Streets. Meeting will continue through the afternoon and, if circumstances warrant, will hold over until the next day.

"If there ever was a time when the knitting manufacturers should get together, it is at the present time, and we hope you can arrange to be present, but should you be unable to attend in person, we shall expect a communication from you, outlining your views and suggestions and, if possible, binding yourself to conform to such plan of action as the majority of those present may decide upon."

THE CONSTRUCTION OF CHINCHILLA CLOTH

BY GREENWICH

The class of goods known as chinchilla cloth will undoubtedly be in great demand the next heavy weight season. Many mills are getting out samples of these goods, some being made from cotton warp and wool fill-

FIG. 1.

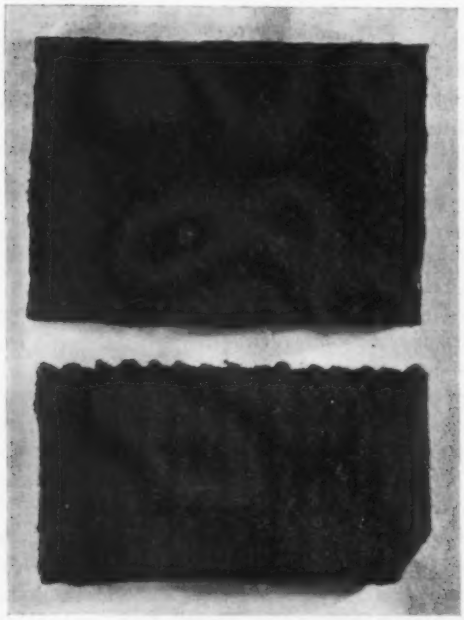


FIG. 3.

ing while others are made from wool warp and wool filling. Difficulty in their manufacture is being experienced in mills where these goods have not been made, as special knowledge and experience are required. The right kind of wool must be used to get the best results on chinchillas. Neither a very coarse nor a fine wool will give as good results as a medium staple. California and Ohio wools with a certain amount of shoddy and waste were used extensively years ago when chinchillas were in demand. If the proper wool is not put into these goods and the weave and lay-out is not as it should be, the overseer in the finishing department will find no end of trouble, as the finish depends on the stock and weave.

Some manufacturers have an idea that with a chinchilla machine a finisher can bring any chinchilla fabric out right. They will find from experience that they have made a

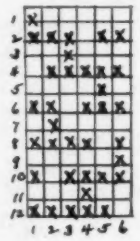


FIG. 2.

great mistake if the goods are not right before they leave the weave room.

The fabric illustrated as Fig. 1 and which is called a plain small nub chinchilla was

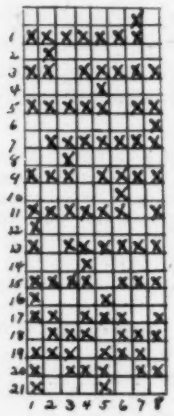


FIG. 4.

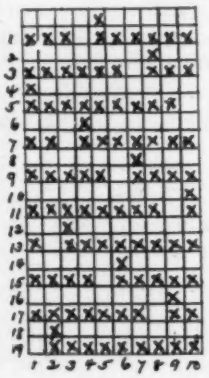


FIG. 5.

made from a mixture of 50 per cent. Ohio wool and 50 per cent. medium shoddy, the stock being colored black for the warp. The filling was made from a mixture of 35 per cent. Ohio wool and 65 per cent. noils, medium shoddy and waste, colored brown. The warp has 2,880 ends of 3 run warp, 78 inches in the loom, filling 3 1/4 run, 54 picks, finished 26 to 28 ounces per yard 56 inches wide. The weave for this fabric is shown at Fig. 2.

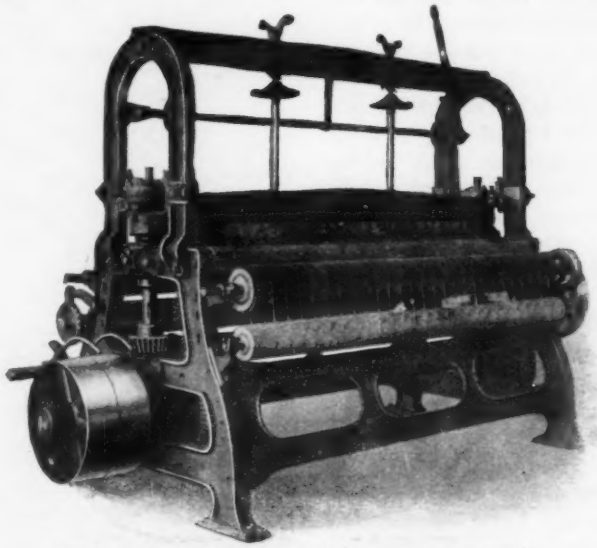
Fig. 3 is a French or block chinchilla. This fabric has a very distinct block effect. The size of the block could be increased in length by repeating the last six bars on the chain draft. The stock used in the warp and filling of this fabric was a mixture of 50 per cent. Ohio wool and 50 per cent. shoddy, waste and noils, colored black. The warp yarn is 2 ply, 3 1/2 run, 1,600 ends, 80 inches wide in the loom; filling, single 3 1/2 run, soft twist, 46 picks per inch, and finished 26 to 28 ounces per yard, 56 inches wide. In the finishing of this fabric a large or small nub can easily be obtained. The weave for this fabric is shown at Fig. 4.

A good cotton warp chinchilla is made from cheap stock using 25 per cent. California wool, 35 per cent. noils and 40 per cent. card waste; 2,400 ends of 14s cotton, 78 inches in the loom; filling yarn spun 3 run. For back filling the stock consisted of 5 per cent. wool and the balance shoddy and waste, spun 1 1/4 run, with 68 picks per inch. The goods are finished 30 ounces per yard, 56 inches wide. The weave for this fabric is shown at Fig. 5.

These goods are easily woven and a good production is obtained if the proper material is used.

THE FINISHING OF CHINCHILLAS

The manipulation of goods in the producing of chinchilla and similar rough face finishes necessitates some special machinery in a woolen mill. Two methods are employed in the portion of the process before the rubbing, which methods are governed by the supply of the machinery, the grade of goods and time. In the first place, the fabric should be so constructed as to produce the best effects in the finishing. The face yarn (filling) should be of a nature to produce a full nap; the weave should be smooth and the fabric, as a whole, have no stiffness, but rather a tendency towards sponginess. If the previous processes have been intelligently manipulated, the fulling (which should be of a short duration), will leave the goods well filled, yet with an absence of hardness or stiffness.



CHINCHILLA FINISHING MACHINE (D. R. KENYON & SON.)

After fulling and washing, the fabric must be freed of streaks due to gigging. Gig thoroughly. Should the conditions admit of it, the piece should be cropped, the nap straightened and then dried. After drying, the nap should be softened up, and the fabric then sheared. In the latter process, instead of the ordinary raising brush, a wire brush is substituted which more thoroughly

and evenly raises the nap. When the required closeness of shearing has been attained, one or two runs are given with laying brush off, after which the fabric is ready for the chinchilla machine, a machine having an oblong surface about two feet wide by five feet long placed in a frame about three feet from the floor, over which the fabric passes very slowly, face upward. Over this is a strong cast iron "follower" of about the same size and shape of the "bed," through each end of which an upright shaft passes, which is movable up and down, by means of a handle. On the under side of this "follower" is a plate of solid rubber securely fastened to it, which, on being lowered, rests on the face of the cloth. On the upright shaft is a mechanism for producing a rotary motion to the follower which rubs on the cloth, twisting the nap into spiral points. Other mechanisms are also provided to transform the rotary to a reciprocal motion, either forward or backward, from side to side, or diagonally. The upright shafts are geared to the main shaft which passes through the lower part of the machine, and which receives motion from the main or counter shaft by means of a belt. The rotary mechanism is capable of being increased or diminished, thereby varying the "sweep."

The illustration shows a machine built by D. R. Kenyon & Son, Raritan, N. J., which has five different motions for producing different finishes of this character, such as chinchilla, whitney, crepe, etc.

The setting of the machine is, like the rest of the different processes of finishing, dependent more on judgment than upon any arbitrary rule that can be advanced as sure, but the amount of "sweep" should not be excessive. The pressure of the "follower" on the cloth is also a matter on which judgment must be exercised. It is also important that the rubbing material be kept free from any tendency to gum up and glaze. The surface of the rubber must also be absolutely true, if not true, it may be due to the wool which forms the back being warped, which if the case, the rubber must be removed and the surface planed. The same also applies to the bottom surface which is covered with a good grade of brussels or velvet carpet. All tendency on the part of the "follower" to depart from the motion required to produce the finish and effect should be reduced to a minimum, such as when a "Whitney" finish is being produced, the tendency to describe a round motion should be checked, and the motion be directed in a straight line. The same with the "Petersham" or round motion, the motion should be round and not elliptic. The speed of the main shaft of the machine should be not over 145 turns a minute, which will produce a speed of the rubber of about 500 turns.

VIGOUREUX PRINTING OF WORSTED

More than a year and a half ago we printed an article from our French correspondent describing this process, which was at that time coming into very extensive use in France. The increasing interest in this process in this country has led to a request for further information on the subject.

The Vigoureux process of printing worsted is not a new invention, having been invented more than fifty years ago by Monsieur Vigoureux of Reims. He moved his factory to Roubaix, and the mill that he founded there is still in operation, being owned by Gaydet.

The process consists in printing slivers of worsted on a special machine. The sliver of worsted, well opened up, is printed with bands of color at prearranged distances in semi-pattern, which may be uniform or irregular. Fig. 1 shows a piece of the printed sliver as it comes from the printing machine.

The sliver is not usually printed in more than one color. Two colors have been tried, but it has never proved satisfactory. It is more expensive and at the same time more injurious to the wool to print several shades, than to mix the slivers which have been printed separately with different colors. If different colored effects are desired in the same mixture, several slivers printed with different colors are passed through the gill boxes.

The Vigoureux printed wool was first used principally in the manufacture of light weight fabrics, but more recently the im-

provement in the process has led to the use of this Vigoureux printed wool in men's wear as well, and it is supplanting mixed yarns produced by the slub-dyed process.

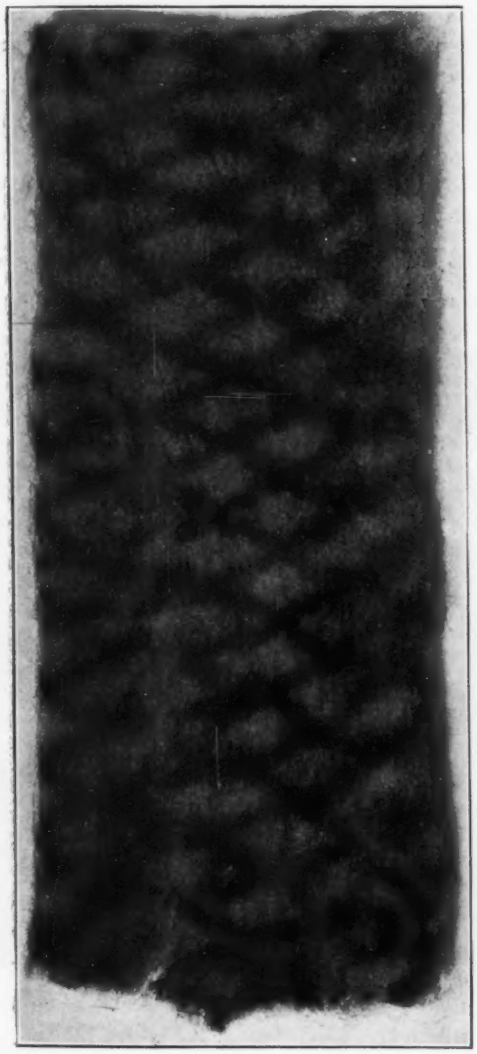


FIG. 1. THE PRINTED SLIVER AS IT COMES FROM THE PRINTING ROLLERS.

The illustration (Fig. 2) shows a Vigoureux printing machine, such as is built by Messieurs Skene & Devallee of Roubaix (Speed & Stephenson, 170 Summer St., Boston, Mass., American agents). The creel holding the balls of top is not shown in the picture. Sixteen balls of tops are set in the creel rack. The unwinding of the sliver is effected by rolls in the rack which are driven by a chain from the printing machine.

The slivers pass directly from the creel to the printing machine through a guide with sixteen holes, shown in the picture, the object of this being to keep it spread out on the sliver table so as to facilitate the printing. After passing through the guides and through the back rollers, the sliver then passes through a set of fallers like any ordinary gill box, the fallers in the box being pinned about ten to twelve per inch. The slivers then pass through the gill box, part of the printing machine and then through the printing roller or rollers, the printing rollers being corrugated or spirally grooved. The middle roller is covered with felt to feed the color to the print roller. The color roller is covered with rubber, feeds the felt roller from the color box in which it is partially immersed, as shown in the picture. The pressure between the different rollers is regulated by a weight or lever or by screws and springs. The printing rollers may be engraved in different ways so as to give different percentage of color or different percentage left white up to 95 per cent. of color or 95 per cent. of white. All these different effects can be produced by from four to six different rollers.

The sliver after being printed is carried up and over roller guides and through the folding or laying attachment, which doubles it up and deposits the sliver on the carriage. This carriage may have a basket placed on it and the slivers run into this basket until the basket gets full. The carriage has a slow motion to prevent the sliver from piling up in one place, so that it may be distributed evenly and allow the steam to penetrate it more easily.

The sliver is then taken to the steam box or steaming apparatus and subjected for one hour or more to low pressure steaming to set the color. It is then withdrawn from the steam chamber and allowed to cool for one or more hours as convenient and then put back again and resteamed for one more

hour, this double steaming being more preferable than a single steaming on account of oxidation, and gives a clearer printed sliver. If it is not desired to give the time to cool off naturally after the first steaming, a blast of cold air may be blown on the slivers which shortens the process.

water for this river-washing should be cold and run in at one end of the vats or tubs and pass out at the other in a continuous system, working always towards the squeeze rollers.

After this process, it is then put through a machine called the back-wash, with two bowls and twelve cylinders for drying pur-

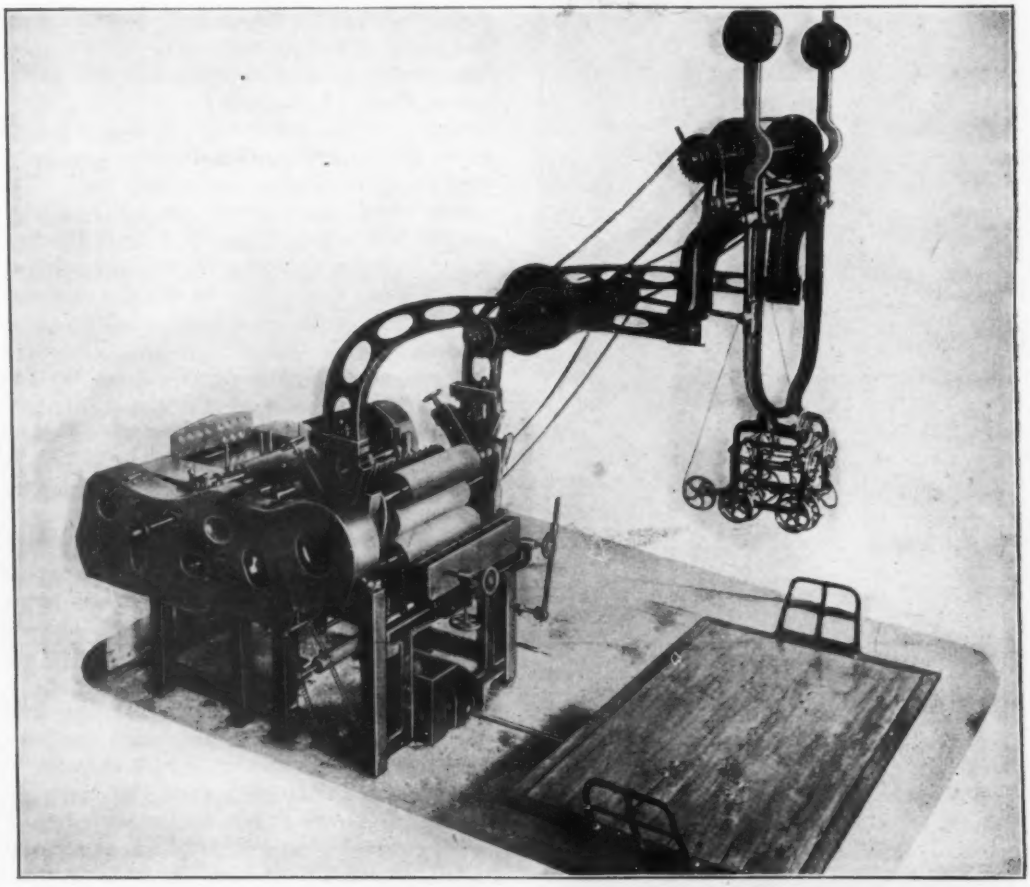


FIG. 2. A VIGOUREUX PRINTING MACHINE WITH TWO PRINTING ROLLERS—GAYDET SYSTEM. (SKENE & DEVALLEE.)

After the second steaming there are several processes of washing that it may be subjected to to bring out the clearness of the printed sliver. One which is used with most excellent results in this country is a system of what is called river washing. In the washing vats are several copper rollers for immersing the sliver as it is run through and it then passes out through squeeze rollers. The

poses. The sliver is then ready for gilling and putting into top, thus completing the process.

By the ordinary method of one roller printing, the production is about 900 lbs. per day of ten hours. Recently a great improvement has been made by the new system of cross-printing with two rollers, Gaydet system, by which, together with the Peil patent

system, the production can be increased to 1,500 lbs. per day of ten hours.

The dyestuffs in most general use are:

A. Natural dyestuffs, such as logwood, fustic, quercitron, redwood and Persian berries.

B. Aniline colors, such as violet acid 6 B N, violet acid 4 R S, alkali violets and blues, Victoria blue, cotton blue, Carmin G, acid greens, tartrazine orange roccelline, wool scarlet, wool blue, acid fuchsine, rhodamines, azofuchsines B and G, indulines, brilliant black, diamond black, naphtol black, naphtylamine black.

C. Alizarine colors, such as alizarine S and W S, alizarine pastes, alizarine blue S and W S, chrome yellow, wool yellow, mordant yellow, yellow flavine W, alizarine orange, alizarine cyanines, alizarine green, Galleine S, Ceruleine S, cloth red, diamond green, anthracene brown, alizarine black, cyanine black G.

The thickening materials most generally employed are British gum, starch, dextrine solutions of lichens, linseed treated with hydrogen dioxide or sulphite of soda. These materials resist the action of acid, but alkalies make them thicker. For light shades the printing solution is thickened with white dextrine, or gum tragacanth. All of these materials are soluble in tepid water and consequently are easily removed by washing. In this country D. & M. Gum (Danker & Marston, Boston) is being successfully used in place of British Gum and gum tragacanth. It seems to carry the color into and through the sliver, better producing brighter shades. It scours out clean and clear, leaving no starchy matter on the surface of the fibers, which is a most desirable feature in the following processes of manufacture.

RECIPES FOR VIGOUREUX PRINTING

A. Logwood Black. Dissolve in 16 pounds of boiling water 6 pounds of dry extract of logwood; let cool and settle. Mix the solution with 4/10 pound of pyrolignite and 1/4 pound of nitrate of iron at 40° B. Thicken with 1/2 pound of gum tragacanth or 1 2/10 pounds of British gum. Dry before steaming and rinsing.

B. Shades with extract of Dyewoods. Brown. Dissolve in 30 pounds of boiling water 5 pounds of extract of redwood (Lima or St. Martha) and 2.5 pounds of extract of quercitron bark. Let cool and settle. Thicken with 3/4 pounds of gum tragacanth, then dilute with 1 1/4 pounds of acetate of alumina at 10° B., adding a little acetate of iron. Dry, steam and rinse.

C. Acid Aniline Colors. Recipe suited for all cases. Dyestuff, 1/100 to 3/100 pound. British gum of destrine, 1/4 to 3/10 pound. Acetic acid, 1/100 pound. Water, 6/10 to 7/10 pound. Do not dry after pound. Acetic acid, 7/100 pound. Water, printing. Steam and wash.

D. Alizarine and similar colors. This class of colors includes all the dyes which are fixed by the action of mordants.

1. Alumina mordant. Dyestuff, 3/100 pound. Water, 1/10 pound. British gum, 1/4 pound. Gum tragacanth, 25/100 pound. Water, 1/2 pound. Add the sulphite of alumina, free from iron, 4/100 pound. Water, 1/10 pound. Oxalic acid, 2/100 pound. Water, 5/100 pound. Do not dry before steaming.

2. Chrome mordant. Dyestuff, 3/100 pound. British gum, 3/10 pound. Water, 6/10 pound. Add oxalic acid, 2/100 pound, and acetate of chrome at 20° B., 8/100 pound. Steam as above.

3. Iron mordant for dark shades. Dyestuff, 3/100 pound. Dextrine or British gum, 1/4 pound. Gum tragacanth, 25/100 pound. Water, 6/10 pound. Add acetic acid, 45/100 pound, and pyrolignite of iron, 1/10 pound. Steam without drying.

E. Substantive Dyes. Dyestuff, 30/100 to 40/100 pound. British gum, 3/10 pound. Water, 4/10 to 6/10 pound. Add acetic acid, 7/100 pound. Let cool and add chrome alum, 30/100 pound and water, 1/10 pound.

The Italian cocoon crop in 1910 amounted to 22,658,969 pounds, as compared with 21,869,957 pounds in 1909 and 27,933,290 pounds in 1908.

The quantity of cotton estimated to have been exported from Peru in 1910 was 55,000,000 pounds, or about 110,000 bales, as against 48,000,000 pounds in 1909.

WASTE REDUCTION

By D. D. TOWERS, Canton, Ga.

Read before the December meeting of the Southern Textile Association, at Atlanta, Ga.,

Reducing waste to a minimum could be more easily accomplished if more care were taken in the picking, ginning and handling of the cotton. In order to keep waste within reasonable limits it is necessary to give every detail of each process constant attention.

One of the first important steps along this line is to have a thorough balance mixing. There should be room enough to lay down forty or fifty bales in one pile, give this a chance to thoroughly air out, then while using from this lot, make up a second lot. If cotton can stand over twenty-four hours after being mixed it is all the better. Some cleaning trunk should be used between your hopper feeder and the breaker. See that all the hoppers are set to carry over the same amount in a given time. Do not use any carding beaters or patent pen grids on the breaker pickers. The common Kitson grid bar, used with a three blade beater and run at about nine hundred revolutions will give good results, provided they are set up correctly, the beaters kept sharp and fan drafts well regulated.

Where an intermediate picker is used it should be equipped with an evener motion, and the laps doffed only as the machine knocks off. These laps should be weighed four times a day and kept as near the standard as possible. In laying up to the finisher, let the apron contain two full laps at about the same time the other two are half full. A carding beater can be used with excellent results on finisher pickers. It must be set very close to the feed roll. When using Uplands cotton, set to one-sixteenth of an inch. This will then give a slight combing effect before the feed rolls release. This will cause more motes and less fiber to be thrown out and will also increase the strength of the yarn. See that the beater blades, pen lags and mote knives are kept sharp and smooth. Clean the feed rolls and evener rolls once a month on each machine, taking them entirely out of machine and cleaning the bearings thoroughly. These rolls run so slowly, that no matter how clogged they may get, they will not show danger by getting hot, but the evener comb belts will begin to break without any apparent cause. If they do not happen to break they will skip and cause uneven work. It is best to run kerosene oil once a week through all slow motion bearings on all the machines. This will cut out the black gum which always forms in these parts.

It is well to have some attachment on the pickers to prevent slip laps. Such a device, made by one of the best known picker builders, consists of a small set of fingers bolted to the plate behind the top calender roll. This is very satisfactory, but the best scheme of this kind is an arrangement, the idea of which was first given the writer by R. D. Thomas. The plate is removed between the cages and top calender roll, and a piece of two-inch shaft with ends made to fit is inserted in its place. In this shaft a series of quarter inch steel wire springs, or long fingers, are inserted, the curve to be on a radius of about ten inches. This spring wire is set at the center of the back side of the bar, bending across and over the bar with the ends reaching to within one-quarter inch of the top calender roll and a short distance above the point of contact between the top and the second calender roll. The pressure of these wire springs will prevent the lap from splitting, and the open space between them will allow a great deal of sand and other foreign matter to drop from the cotton.

Much waste will be made between the finisher picker and the cards, if care in handling the laps is not observed. Rough handling will tear up the top layer so that the card hand will have to pull off sometimes a yard or more before the lap is in condition to feed into the cards. The laps when doffed should be weighed and, if correct, racked on a suitable truck that will hold four to six laps each. Enough of these trucks should be available to store the stock of laps. They can then be rolled out to the cards with a minimum amount of handling.

The amount of waste taken out of the cards depends on the product. All remaining motes, neps and short fiber should here be removed. To obtain the same results from each card, they must be treated separately and they generally require setting up differently, so that the same results will be obtained. The backs of the card are often neglected by the average grinder, who seems to think that if he grinds and sets his tops and cylinders and doffers that his duty is done. The writer has seen screens and back plates removed, whose working edges had been entirely cut away by being too close to the cylinder. Card backs and leaders should be gone over at each grinding and readjusted where necessary. A mistake often made is to set the bottom edge of the back plate further off than the top edge, whereas it should be just the reverse. The bottom edge by being set up to a seventeen or twenty-two gauge, will aid materially in loosening up any remaining motes that the knives did not clear. Then with the top edge off to a full gauge the fibers expand and get into good condition for the flats to begin work on them.

Do not allow card hands to flap off the cards while work is being run. They are bound to throw fly and trash back into the web and once back at this stage there is not much chance to remove it. Cards should be rubbed off and not flapped, so that all the oil may be kept thoroughly cleaned off. The work will run better and with less waste by keeping the floors clean. The moral effect of a persistent effort to keep everything clean is truly remarkable in the results accomplished. Have suitable boxes around for all oily waste, sweeps and white stock. Sweeps should never have to be picked after being sent to the waste house, as no white stock at all should be swept up over the oily floor. All clean stock should be picked up as soon as dropped.

At the draw frames more good stock can be ruined by neglect and lack of attention than at most any other process. Each hand should have a separate waste can and the amount he makes taken up and weighed each day. Put the hands on their metal and get up a race to see who can run with the least amount. Care should be taken to see that the stop motions are all kept in perfect condition. Set the rolls as close as possible for the stock being run; especially should the front and second roll be set close. Pay special attention to the tension between front roll and trumpets; this tension should always be slack enough to prevent any stretch to creep in. Have the trumpets reamed to suit the sliver being run, and set close enough to the bite of the calendar rolls to prevent any drawing as it passes through. The question of tension on draw frames as well as on fly frames is very important and should be regulated to suit weather conditions in order that no stretching may take place. Scour the metallic rolls once a week, top and bottom, and go over the weights to see that they all hang free and clear.

If the drawing frames have leather covered top rolls, have them covered with winding leather, spirally wound on and not with cotts. When so covered in this manner buffed and varnished they will outrun three or four when covered with cotts. After the frames with leather top rolls have been run several years the fluted steel roll becomes slick and will not bite the fiber as it should, causing slippage, which will cause uneven work and waste. To overcome this take out the steel rolls and scour with pumice stone. This stone can be obtained in pieces large as my fist and should be held in the hand and rubbed hard along the direction of the flutes. This will remove all the glaze and the rolls will bite the stock properly. After scouring with pumice stone, polish with a little Spanish whiting. This method can be used for putting the fly frame rolls and spinning rolls in good condition. On fly frames see that the roving traverse is making the maximum stroke. This will produce better work and save the top rollers.

The frame hand should not allow singlings and doublings to go by him. Have every bobbin so marked with chalk so that when these are located in the spinning room they can be shown to the hand who made them. At the fly frame the trouble with the pocket knife begins. Each hand, if allowed, will

keep a sharp knife with which to cut off small pieces instead of running them off. To say nothing of the waste thus made, the bobbins will be ruined by constant cutting. No frame hand, spinner, doffer or spooler should be allowed to use the knife to clean pieces. Every particle should be run off where possible, and any remainder should be pulled or slipped off.

Spinning frames, running on filling especially, should receive the closest attention at doffing times. Improper doffing will cause waste in the weave room. Quills should run off clean and clear in the shuttle. All broken quills should be assorted out and destroyed. Filling should be run with as short a draft as possible. Use small rings and a traveler heavy enough to produce a firm quill with a maximum amount of yarn thereon. It will be economy for any mill of 600 looms or over to use a winding machine for rewinding all quills of filling that are only partly filled. There is always an accumulation of this stuff which the weavers will not run if they can possibly avoid it. By using a winding machine all this filling can be rewound on quills that will fit the shuttles. Very often there is a tangled doff on the filling frame after the quill is over half full. By cleaning this off and rewinding most of it can be saved, a better production obtained from the looms with this rewound filling than when using filling from the spinning frame. To obtain the best results filling should always be conditioned. This may be partly accomplished in several ways: by steaming, sprinkling, or heating, to a high temperature; the reason for heating being that the wax on the fiber will soften so that when cooled it will set the twist.

Have all the spinners wear a short, special apron with large pockets to put all their white or clean waste in. These aprons will hold enough to enable the spinners to make their rounds without dropping any waste on floor. They can then be emptied at the end of alley in suitable boxes. With a little care in the use of these aprons the spinning room floor can be kept free from white waste. Look out that the bands are not made too large. The smaller, consistent with proper strength, the better. Bands that are too large to fit the bottom of the whorl will cause more or less soft yarn. Hard twisted, three to four hank roving is better for making bands than yarn. When a roving band gets slack it will fall off, while a yarn band usually runs many days after it is too slack, making soft yarn.

The spoolers should be closely watched. It seems to be a common failing for the spoolers not to run off a bobbin if it happens to break near the last two or three layers. They would much prefer to lay it up and cut the yarn off at the first opportunity. More high price thread waste will be made around the spoolers if the closest attention is not given them. Spooler hands should be made to straighten up and tie off any yarn that they tangle. With a little care a bobbin which has been tangled at the end can be tied off and the yarn saved. Look out for the hand knotters, which are now considered necessities. Keep them in perfect condition, as nothing short of a clean knot would prove worth tying. By all means use spools with metal shields on the head, the waste thus saved by not having any splintered spool heads will soon pay for the extra cost. See that the measuring mechanism on the warper is accurate. A bearing on the measuring roll will cause trouble and waste later on. Beams will run out together if proper care is taken at the warpers.

Much waste can be, and usually is made around the slashers. There can be no set rule for making the size. The size mixer must be able to tell from the looks and feel as to when he has it right. As the weaving depends largely on the size, it is necessary to have a competent man to handle the slashers.

A mistake very often made when using a neutral of alkaline starch is not to cook it enough. Such starch on first being boiled becomes very thick, but it is not fit for use until it has boiled thin again; this usually requires thirty to forty-five minutes of hard boiling. Size, if prepared correctly without the use of any loading material, can be made to penetrate average warp yarns to about the extent of 14 per cent.; any amount above

this is usually left on the surface. See that the yarn is not unduly stretched in passing over the slasher. When a beam is first started it is necessary to slacken the tension.

Lack of care and attention to the slashers has caused many a weaver to lose his job. The writer has seen slashers that were said to have been run for years without the side shaft geared up, the receiving roll being made to pull the entire load of the creel and size box. As a result all weak or tight ends were snapped, and the warps on the looms showed hundreds of loose ends coming up. An arrangement is often used on the loom beam with good results, enabling the warp to be run up to the lease rod before it is cut out. This consists of some form of apron secured to the barrel of the beam, and fitted with eyes into which the warp can be tied at the slasher, this apron being long enough to wind around the beam and extend up to the whip-roll. Three or four yards of warp could thus be saved on each beam. At the Proximity Mills someone has invented and patented an arrangement of this kind using thin steel bands fastened to the barrel of the beam with a clamp to catch the warp. These steel bands are flexible and wind around the beam. This device is said to be very successful.

Looms should be kept lined and beveled and the shuttles accurately boxed at all times. Only in this way will the loom make perfect cloth. The amount of power consumed by a loom properly set up will often vary 30 per cent. from that caused by a loom in poor condition. On white work the improper setting of the harness will not show as readily as it will on colored work, however, to obtain the face required on the cloth the looms should be accurately timed. Bad cloth should be shown up to the weavers by sections, as each section is called. Both the loom fixer and weaver should see the cloth. A report should be posted each day, showing the amount of seconds made on each section. This will usually spur the fixers up to their utmost in order to keep the seconds down.

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The total export of silk goods in 1910 from France amounted to about $72,278,500, an increase of over $14,282,000 over 1909.

THE FIRE DEMON

It is not often that our daily papers have to chronicle the details of a fire involving a loss of more than one million dollars; but statistics compiled by the various fire insurance companies, boards of underwriters, etc., lead to the belief that there are comparatively few days in the year when the total fire tax in the United States does not exceed the above mentioned figure. The actual loss by fire is supposed to average about two hundred fifty million dollars per year. It is certainly within the bounds of probability that the expense of maintaining and operating fire departments, and the operating costs connected with fire insurance, would make up another hundred twenty-five million dollars.

Innumerable means have been devised from time to time to minimize this loss, involving the use of both automatic and hand-operated devices. It is needless to say that the former are, at the inception of a fire, much the more valuable by reason of the fact that, when properly operative, they act as soon as the fire has made its presence distinctly manifest. As a matter of fact, in many cases, particularly those in which automatic sprinklers have operated, the fire is actually extinguished before it is seen by any one. In these cases, of course, the automatic fire alarm has brought fire-fighting apparatus to the spot, but in about two-thirds of the cases, the apparatus is not called upon to do any work further than what the sprinkler system has already accomplished.

Students of the subject of fire prevention and protection seem to be unanimously of the opinion that the automatic sprinkler is by far the most important of all fire protection devices. As a matter of fact, no instances are on record where a fire, starting in a building equipped with modern automatic sprinklers in good operative condition, has extended beyond a limited space in that building. Be it understood that when someone has shut the water off the system, or there is an inadequate supply of water, or the system is crippled by an initial explosion, it is not "in good operative condition."

Among the strong points in favor of the use of sprinklers might be mentioned the facts that it puts all of its water on the exact place to do the most good; it operates only where it is needed; it works just as effectively in a room full of smoke as anywhere else, and stays on the job when the heat would drive human firemen away.

When we realize that a fireproof building is fireproof in the same sense in which a furnace is fireproof, and that its contents will burn in much the same way as will those of a furnace, it is very apparent that the need for automatic protection to those contents is very great. The six-million-dollar fire in the State Capitol at Albany a few months ago illustrated this fact most beautifully. Many of the documents and records destroyed were absolutely irreplacable, and yet from the testimony of eye witnesses who were on hand at the time the fire started, a single pailful of water directed at the right spot would have extinguished it.

A reduction of fire losses by means of automatic devices operates really in three ways. In the first place, there is a conservation of created wealth by virtue of the fact that valuable property or records are not destroyed; in the second place there is in very many cases the ability to continue business with, at most, but very brief interruption; and in the third, there is a very definite saving in fire insurance premiums, enough, in fact, in the general case, to completely pay for the sprinkler equipment in about three or four years. Everything, therefore, points to the great desirability of making an installation which will not only pay for itself in a short period, but probably be worth many, many times its cost in potential saving.

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The first power loom built in this country for weaving broad silks was made by William Ryle of Paterson, N. J., in 1842.

When Christopher Columbus discovered America in 1492, he found the cotton plant growing wild, but the earliest effort to cultivate it in the United States was in 1621, in what is now the State of Virginia.

A CIRCULAR LOOM

BY WESSEX

A new weaving machine invented by a Lancashire mill manager, Christopher Whalley of Clitheroe, departs from all traditions of loom design. The shuttle is stationary and the warp beams and threads, the reed, the heddles, the cloth and cloth take-up roller all revolve. The beams are of the ordinary cylindrical type, fitted with a let-off motion. The shuttle is large, taking cops of filling 27 inches long and 1 1/2 inches thick. The reed is circular and there is a heddle for each warp thread. Cards like dobby-cards control the heddles and the shedding. The whole revolves upon a central shaft and the motions of shedding, feeding with filling and heating-up are continuous while the machine is at work. The heating-up is done without special mechanism by setting a segment of the reed wires out of parallel so that they beat-up once in every seven inches. Forks in the reed feel for the filling and stop the weaving and the taking-up in the event of a break.

The machine is at work on goods 134 inches wide weaving a pattern on 96 ends and hence doing what can ordinarily only be done by a jacquard. The loom is perfectly adaptable to plain weaving and the continuity of the operation and efficacy of the stop-motion is said to do away with thin places, cracks or setting-on marks. The process involves little or no strain upon the filling and is limited in speed by little more than the time taken in shedding. It is expected ultimately that the production will be at least as great as from a common wide loom and money is being found to enable the inventor to develop his apparatus in different directions. The machine is heavy and carries probably 1,500 pounds of metal on its central shaft and it is scarcely possible that it should be cheap, but it is hoped that it will become more useful to manufacturers of wide and heavy goods.

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The total consumption of American cotton for the twelve months ending August, 1911, was 11,559,401 bales; East Indian, 3,647,714 bales and Egyptian, 664,822 bales.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

A HAND BOOK OF WEAVES

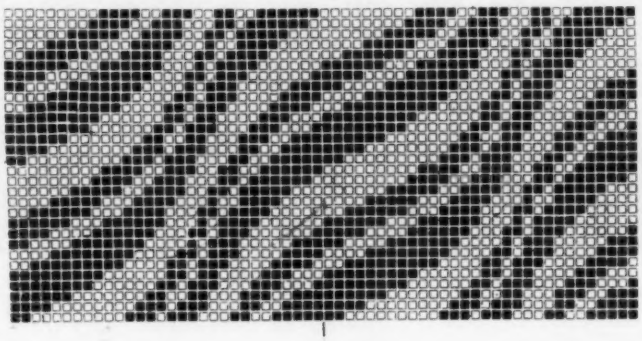
By G. H. OELSNER, Director of the Weaving School at Werdau.

(Translated and Revised by Samuel S. Dale.)

(This series of articles began in July, 1911.)

A steep twill with the float rising three picks at each thread requires but one-third the original number of shafts in the base weave when that number is divisible by 3. For example, Fig. 360 shows a 13-shaft steep twill derived from a 39-shaft regular twill; Fig. 359, a 15 shaft from a 45 shaft; Fig. 362, a 16 shaft from a 48 shaft. If the original number of shafts is not divisible by 3, the resulting steep twill will require the same number of shafts as the base weave, as shown at Fig. 356, both base weave and steep twill being 32 shaft.

FIG. 368.



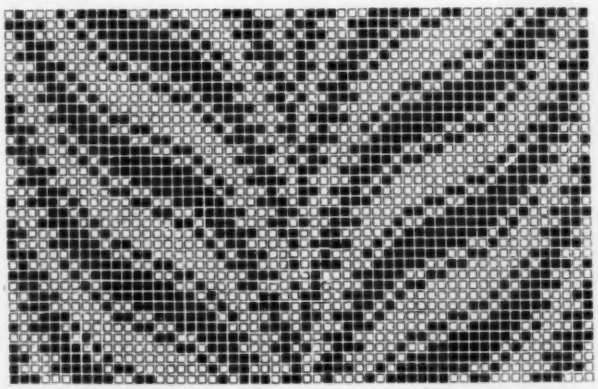


FIG. 369.

UNDULATING TWILLS

Undulating twills are formed by offsetting the warp and filling floats irregularly.

Fig. 363 ..... 16 ends, 8 picks

(Copyright, 1911, by Samuel S. Dale.)

Fig. 364 ..... 30 ends, 12 picks
Fig. 365 ..... 40 ends, 8 picks

As the twill line is less distinct when the float is offset two threads instead of one, a

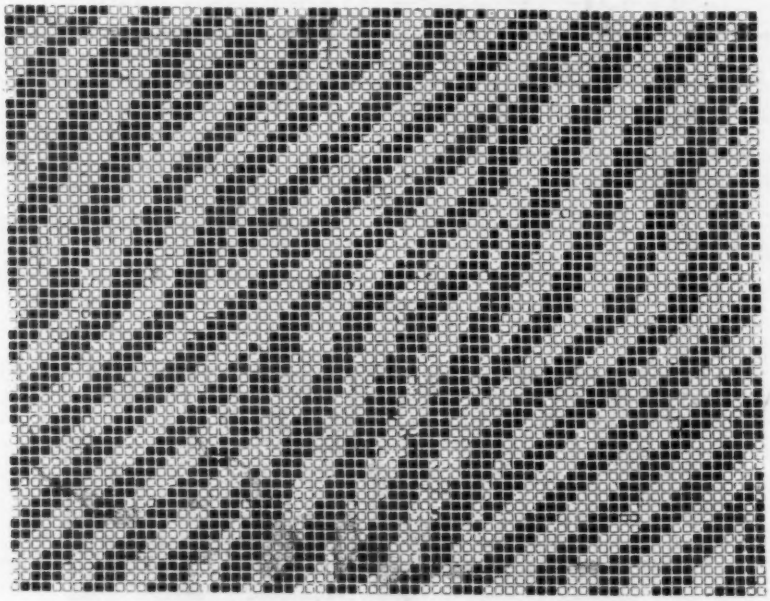


FIG. 370.

FIG. 371.

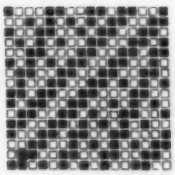
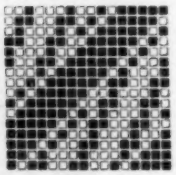


FIG. 372.



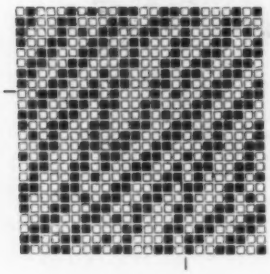


FIG. 373.

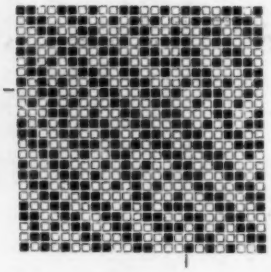


FIG. 374.

Fig. 366 ..... 18 ends, 9 picks
Fig. 368 ..... 30 ends, 15 picks
Fig. 369 ..... 56 ends, 12 picks

twill with a longer float is often used in combination with a regular twill for undulating twill effects. Thus, Fig. 367 is formed by a

$^{2}\!-\!_{2}$ twill offset one pick, combined with a $^{3}\!-\!_{2}\!-\!^{1}\!-\!_{2}$ twill offset two picks; the weave pattern covers eight shafts and eight picks.

Fig. 377 shows a weave pattern obtained by transposing two twills with a 5-shaft double satin as a motif.

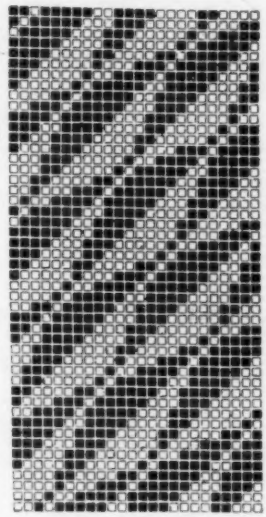


FIG. 375.

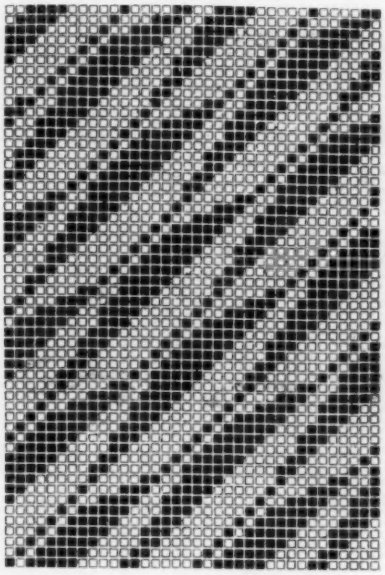


FIG. 376.

Another example is shown at Fig. 370, in which are combined a $^{3}\!-\!_{3}$ twill, offset one pick, and a $^{6}\!-\!_{6}$ twill, offset two picks. Each twill covers 24 threads in each direction. The two twills are transposed in plain weave order, the whole pattern covering 48 threads.

Figs. 373, 374, 375, 376, 378 and 379 show other variations of these weave effects. The same effect can be obtained with a regular twill weave by using alternate groups of fine and coarse warp yarn, giving each a different set in the reed: for example, the fine warp reeded four, the coarse warp two in a dent.

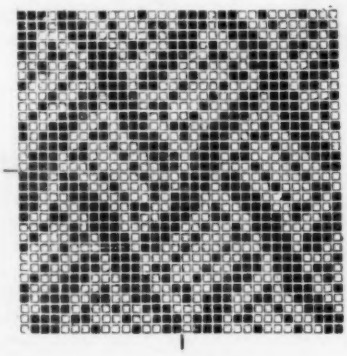


FIG. 378.

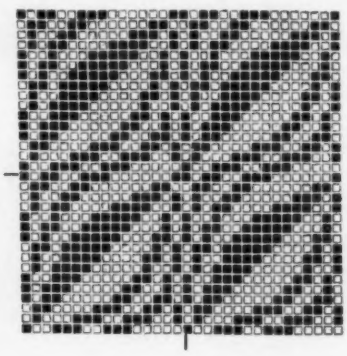


FIG. 379.

Attractive patterns can be obtained by using other motifs than the plain weave.

CROSS OR REVERSED TWILLS

Cross or reversed twills are formed by reversing the direction of the twill at intervals. The twill can be reversed in either the warp

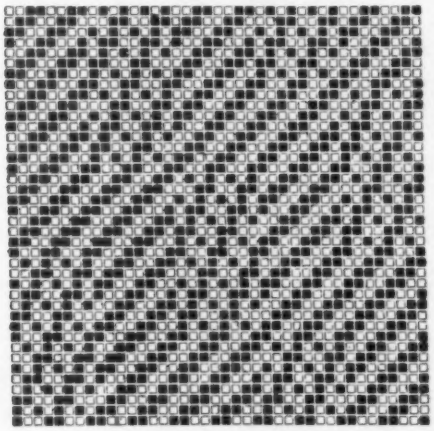


FIG. 377.

or filling. If in the warp, as shown at Fig. 382, a longitudinal stripe effect is obtained; the filling is thus stitched more closely and is made less prominent. In Fig. 382 a $^{2}\!-\!_{2}$ twill is reversed every two threads. The warp threads are still woven $^{2}\!-\!_{2}$, but the reversing of the twill causes every alternate pick to interlace in plain weave order. If, on the other hand, the twill is reversed in the direction of the filling, as in Fig. 383, the filling becomes more prominent than the warp, which is then stretched closer than the filling. These remarks apply to balanced twills, $^{3}\!-\!_{3}$, $^{4}\!-\!_{4}$, etc.

Among reversed or cross twills is classed the $^{1}\!-\!_{3}$ weave stitched 1, 2, 4, 3, Fig. 380. This weave is sometimes styled a satin and frequently substituted for the regular satin. It is extensively used for a great variety of goods. It is usually stitched in 1, 3, 2, 4, order. The same result is obtained in both cases, as well as with the order 1, 4, 2, 3, or 2, 3, 1, 4, or 2, 4, 1, 3.

Fig. 381 is a $^{3}\!-\!_{1}$ reversed or cross twill, stitched in 1, 3, 2, 4 order.

Fig. 382 is a $^{2}\!-\!_{2}$ twill, reversed warp ways and often called croise. Fig. 382 is well suited for woolen frieze fabrics as it shows no twill.

Fig. 383 is a $^{3}\!-\!_{3}$ twill reversed filling ways.

Fig. 384 is a $^{4}\!-\!_{4}$ twill reversed warp ways.

Fig. 385 shows an 8-leaf twill, $^{3}\!-\!_{2}\!-\!^{1}\!-\!_{2}$, reversed filling ways.

Motifs for attractive designs can be obtained by rearranging the parts of a twill so that two groups of threads with the twill running in the same direction alternate with two groups having the twill running in the opposite direction, Figs. 386, 387 and 388. The twill in either direction may include more than half the weave, and the two

FIG. 380.

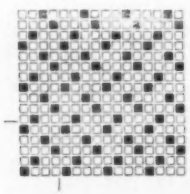


FIG. 381.

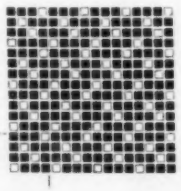
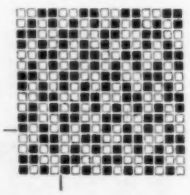


FIG. 382.



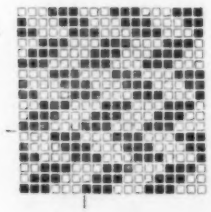


FIG. 383.

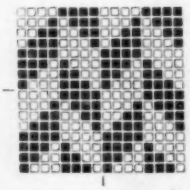


FIG. 384.

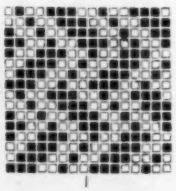


FIG. 385.

groups may be of unequal size. Care must be taken to have a sharp break at the junction of the right and left twills, the risers of one twill coming opposite the sinkers of the other.

Figs. 389 to 404 are weave patterns with the twill reversed, some warp ways, some filling ways, and other in both warp and filling.

The following are reversed warp ways,

FIG. 386.

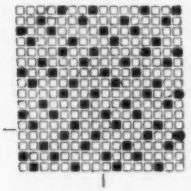


FIG. 387.

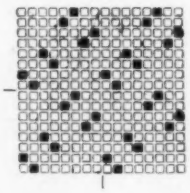
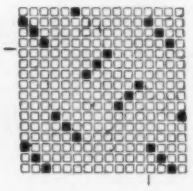


FIG. 388.



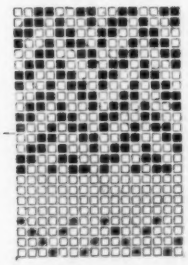


FIG. 389.

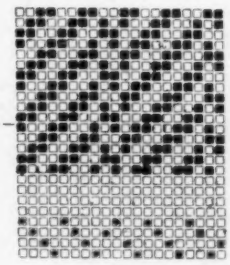


FIG. 390.

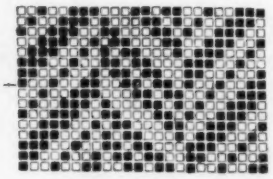
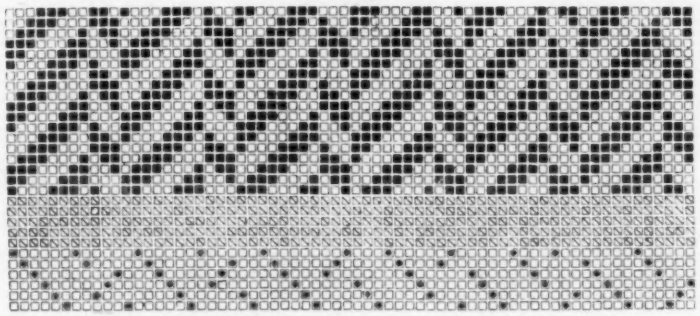


FIG. 391

FIG. 392.



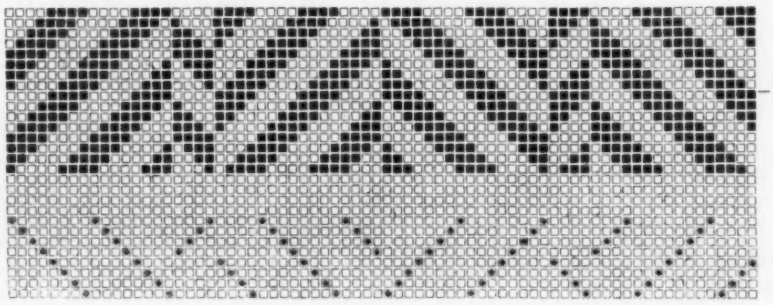


FIG. 393

forming a longitudinal stripe:

Fig. 389, twill $^{2}—_{2}$ divided 4 and 4.

FIG. 394.

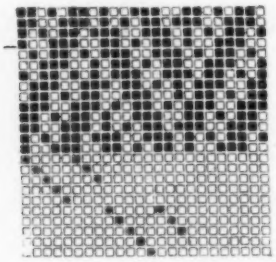
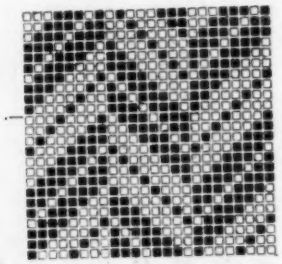


Fig. 398, twill $^{3}—_{3}$ divided 6 and 3 each way.

FIG. 395.



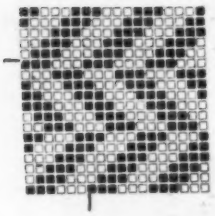


FIG 396.

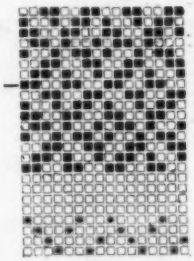


FIG. 397.

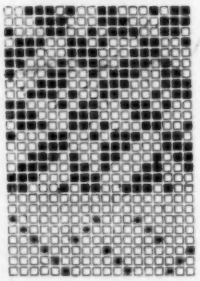


FIG. 398.

Fig. 390, twill $^{2}—_{2}$ divided 8 and 2.

Fig. 392, twill $^{3}—_{3}$ divided 8 and 3.

Fig. 393, twill $^{4}—_{4}$ divided 16, 4, 16, 16, 4 and 16.

Fig. 394, tweep twill $^{5}—_{2}—^{1}—_{2}$ divided 8 and 8.

Fig. 395, twill $^{3}—_{1}—^{3}—_{3}—^{1}—_{2}$ divided 8 and 8.

If a twill weave does not permit of a sharp break at the point of reversal, another twill is made by substituting risers for the sinkers, and sinkers for the risers, of the first twill, Fig. 391. One is then used for the right twill; the other for the left. This method, however, necessitates an increase in the number of shafts.

Fig. 396 shows a $^{3}—_{3}$ twill reversed filling ways.

In Figs. 397 to 404 the twill is reversed in both warp and filling.

This arrangement is used for the production of a great variety of designs.

Fig. 397, twill $^{2}—_{2}$ divided 4 and 4 each way.

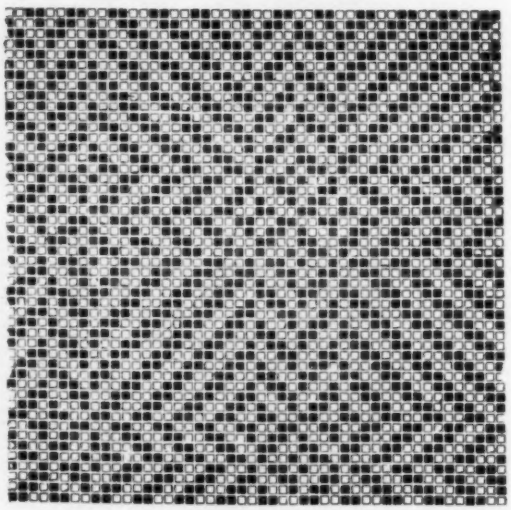


FIG. 403.

Fig. 399, twill $^{2}—_{2}$ divided 16 and 16 each way.

Fig. 400, twill $^{2}—_{2}$ divided 12 and 4 each way.

Fig. 401, twill $^{2}—_{2}$ divided 12 and 2 each way.

Fig. 402, twill $^{2}—_{2}$ divided 16, 2, 5, 2, 5, 2 each way.

Fig. 403, twill $^{2}—_{2}$ divided 16, 4, 4, 16, 4, 4 each way.

FIG. 399.

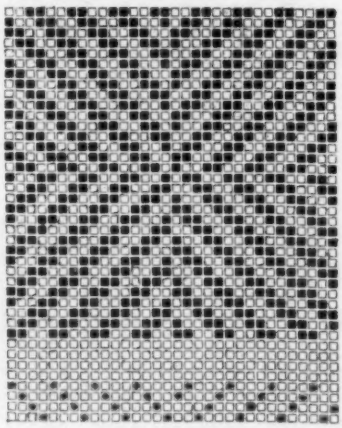
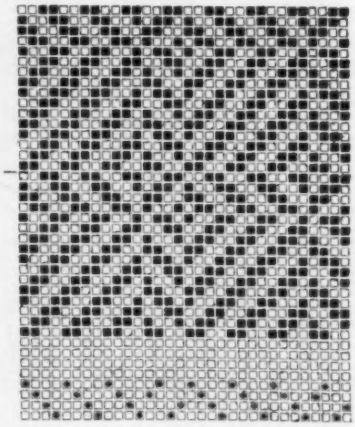


FIG. 400.



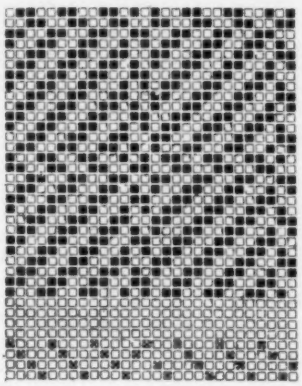


FIG. 401.

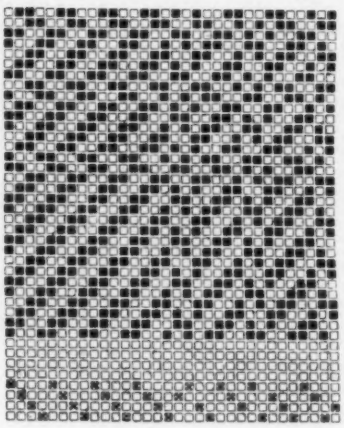


FIG. 402.

Fig. 404, twill $^{3}—_{3}$ divided 24, 3, 24, 3, 6, 3, 6, 3, 6, 3, 6, 3 each way.

Very attractive patterns are made by reversing the twill in accordance with previously selected motifs. An example is shown at Fig. 405, which is developed from the motif, Fig. 406 with a $^{3}—_{3}$ twill.

Another design is shown at Fig. 414, in which isolated squares of 12 threads each are formed by reversing the twill alternately in warp and filling. In this particular pattern the twill is reversed every 3 threads. Figs. 407 to 419 show several variations of this class of weave effects, of which the number is unlimited.

Fig. 407, pattern 24 warp, 72 filling threads.

Fig. 408, pattern 8 warp, 4 filling threads.

Fig. 409, pattern 12 warp, 6 filling threads.

Fig. 410, pattern 8 warp, 8 filling threads.

Fig. 411, pattern 6 warp, 12 filling threads.

Fig. 412, pattern 20 warp, 20 filling threads.

Fig. 413, pattern 16 warp, 8 filling threads.

Fig. 414, pattern 24 warp, 24 filling threads.

Fig. 415, pattern 18 warp, 36 filling threads.

Fig. 416, pattern 16 warp, 32 filling threads.

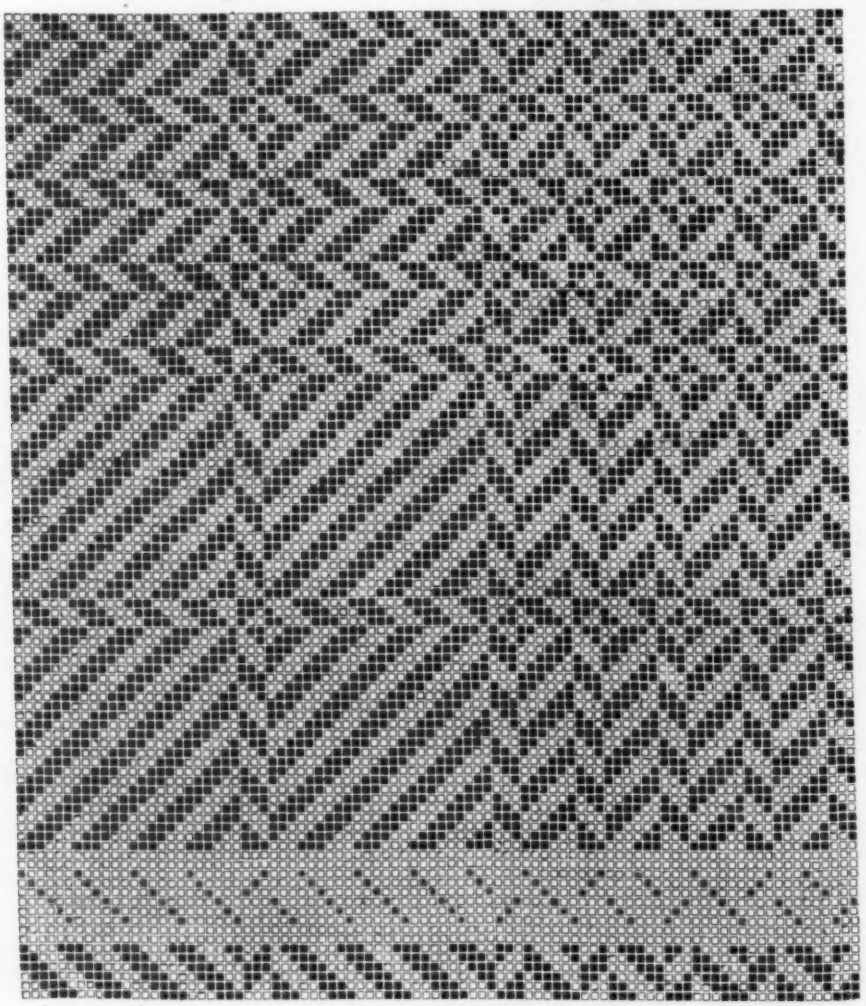


FIG. 404.

Fig. 417, pattern 26 warp, 26 filling threads.

Fig. 418, pattern 40 warp, 44 filling threads.

Fig. 419, pattern 24 warp, 48 filling threads.

(To be continued.)

ENGLISH NOTES

By Our Special Correspondent

The Silk Club of Manchester, waste silk spinners and silk noil merchants, are at one upon the proposal to make length of staple the determining factor in deciding whether noils are to be dutiable or free. The Club officially calls the basis of length "undesirable," and all parties recognize it as incompatible with the continued export to America of long tussah noils. Exhaust (or recombed) noils may be safely below the limit

of length, but there is not in practice any means of securing that noils "noiled at the 4th" and straight from the flat dressing frame, shall not contain a percentage of long fiber. The spinner has every inducement to take out every long fiber, for he can sell it at $1.18 per pound, as against about 28 cents for noils. None is allowed to escape into the noils deliberately, but it is not possible to guarantee that none does. Noils are a by-product produced against the spinner's will, representing all that is left of the boiled-off silk waste after he has extracted all the long fiber he can. As such the material is put upon the market and the effect of a decision excluding the long noil from America will be felt chiefly by two parties. The American manufacturer will lose his foreign supply and the English producer will lose the customer who has latterly been able to pay the best prices. Granting always that the American woolen manufacturer continues to buy short or recombed noils, the decision may even be of benefit to English noil merchants and spinners of short waste silk. Long noil will probably come down in price to a point leaving a more favorable margin between long and short, so facilitating combing operations.

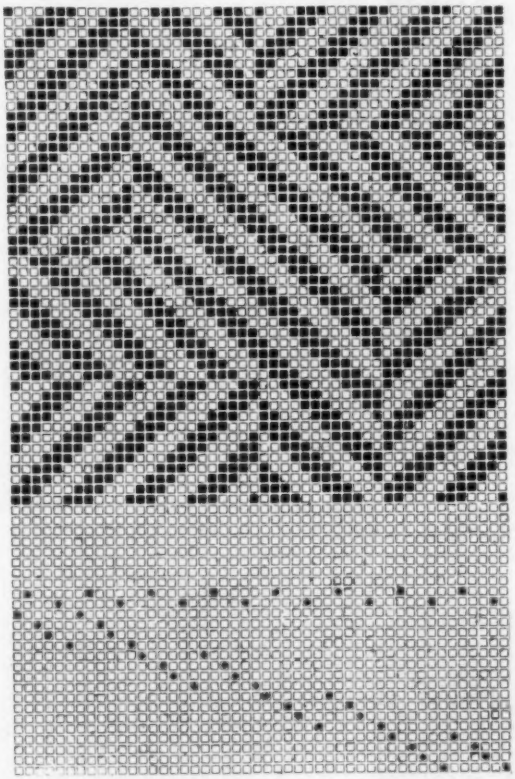


FIG. 405.

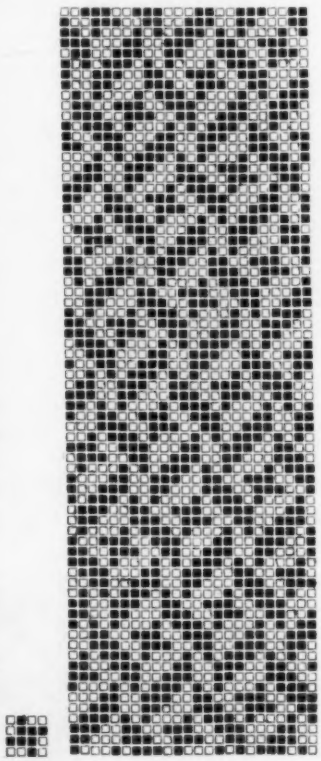


FIG. 406. FIG. 407.

The only basis one hears advocated as an alternative to the proposed limit of length is a limit of price and the limit might even vary with the price of the raw material. With China tussah waste at 42 cents long noils are now around 28 cents and when waste was at 18 cents noils were at 12 cents. Drafts must always cost more than waste as they have to support an expense of 16 cents for cost of dressing, the cost of discharging

and a sinkage, or invisible loss, of probably 20 to 30 per cent.

* * *

One or two Yorkshire mills that have escaped from the business in carded woolens made from waste into the trade in tweeds from pure wool have manifestly done the better since the change. Their profits probably do not rival the reputed ones made in Scotland. If there is a touch of exaggeration in the statement that some of the Scotch tweed mills are netting fifteen dollars per piece, the exaggeration is the manufacturers' own. Profits ranging up to $150,000 are said to be made by single mills in one year. Scotch mills have not always this fortune, but tweeds are selling well and while the fancy worsted firms are unable to make up

FIG. 408.

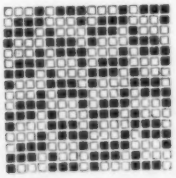


FIG. 409.

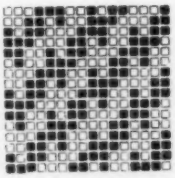


FIG. 410.

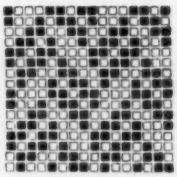


FIG. 411.

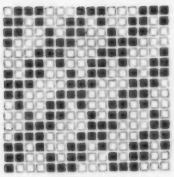


FIG. 412.

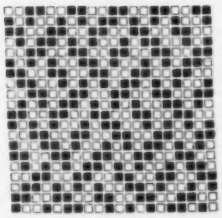


FIG. 413.

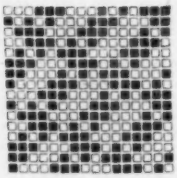


FIG. 418.

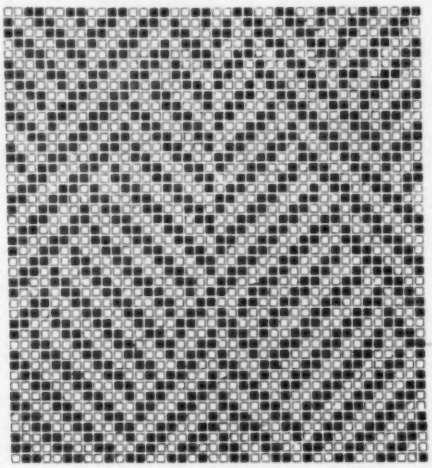
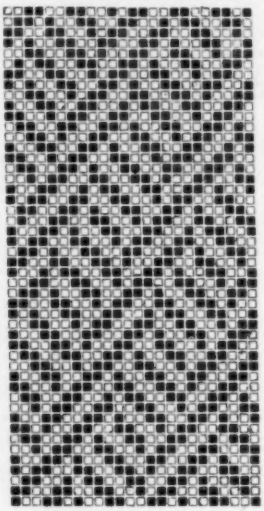


FIG. 419.



their minds about the future course of prices, business is going straight past them to Scotland. The Scotchmen are not letting good fortune make them heedless of their good name. A Liverpool tailor in a case instituted by Scotch manufacturers has had $225 to pay for selling as "Scotch tweed" a fabric consisting 34 per cent. of cotton. Manufacturers prompted the case and supplied the evidence, but the work of prosecution was undertaken by the Government.

FIG. 414.

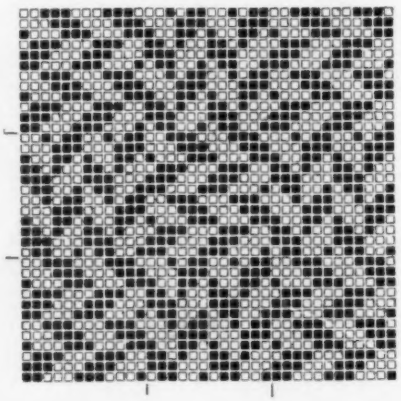
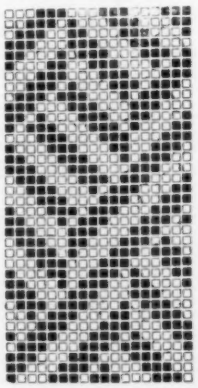


FIG. 415.



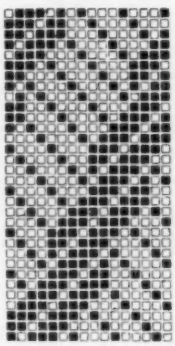


FIG. 416.

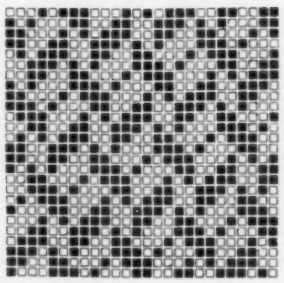


FIG. 417.

* * *

A prolonged series of newspaper advertising is directing Lancashire spinners to the benefits of buying raw cotton direct and the disadvantages of buying through Liverpool. The advertising has been effective in raising discussion and apparently also in inducing some spinners to give another trial to a system which has not always worked well in the past. Among other sins of which Liverpool stands accused is that of forcing up prices of staple American sorts to a price far in excess of that at which direct traders are able to sell. Staple cotton from the South is of the more interest to Lancashire because of the deterioration of Egyptian qualities. Of this deterioration J. A. Todd of Cairo has published details in an address to the Cairo Scientific Society. Three principal causes of defectiveness were named: 1, want of strength; 2, want of uniformity, short and long being mixed together; 3, bad general condition owing to the presence of rubbish. The extent of the deterioration varied in different qualities. Upper Egyptian had actually improved. In Sakels the depreciation was slight. In the finer sorts, like Jannovitch, the deterioration was 3 to 5 per cent., and in Afifi well over 10 per cent. Sakels and Tannovitch have only Floridan and Georgian competition to fear, but Afifi,

which used to be the most important raw material for 50s to 80 twist, is giving way to long staple American, so that 50s American are quoted now alongside Egyptian 60s. The matter is being brought urgently to the notice of planters, who are being advised to drop Afifi and produce a new medium quality to match the stuff of fifteen years ago. This is counsel that will probably be repeated with more emphasis by the Lancashire men who are to visit Egypt next October.

* * *

Direct sellers of American cotton are for the present making most noise, but other direct sellers are heard of. There are, for example, graders of American rags who wish to have nothing to do with merchants or auctioneers, but to sell only to the manufacturer. The same desire is exhibited by a seller of American mohair. The reception of these offers by the persons to whom they are addressed is on the whole less enthusiastic than might be fancied. The manufacturing consumer is less swayed by the idea of buying direct and avoiding middle profits than by the chance of getting exactly what he wants at the lowest price. The dealers on the spot are able often to show him the material in bulk before buying. They know fairly well what their customers require and are present to be punished in case their deliveries are wrong. They command a confidence that the distant direct seller has yet to earn and that as a general rule he only can earn by establishing an office in the manufacturing district. This has been done by at least one American rag-grader and by various Turkey mohair merchants. In offering goods at long range the direct seller is at a real disadvantage over those whom the buyer sees daily or at least twice a week. He is at a disadvantage in two ways, for it is the case especially in odd and occasional lines of material that one buyer will pay more than another for the same stuff on the same day. Dealers in wastes for the carded woolen trade, for instance, would never find a living but for their peculiar knowledge of individual requirements and individual capacity to pay.

British farmers do not always take kindly the advice tendered to them through the Bradford Chamber of Commerce. They farm for mutton rather than wool and plume themselves on knowing more than dealers or manufacturers about farming business. In a new manifesto farmers' susceptibilities are considered to the extent of asking growers to "exercise such action as they deem expedient" in helping to keep grey and black hairs out of white wool. Further the wool trade section of the Chamber recommends:

1. That farmers should not breed from black or grey sheep.

2. That the greatest care should be taken in selecting rams from flocks as free from black hairs as possible.

3. That black and grey lambs be slaughtered.

A certain amount of countenance for these suggestions may be derived from unimpeachable farming sources. Thus in the Wensleydale Flock Book, rule 11, forbids any member of this organization breeding from leaving any black buck entire when it is six months old; and prohibiting the sale of any black ram for stud purposes. In this case the wool dealers can affirm that they are only urging farmers to do what they know they ought to do in the interests of wool prices. The farmers on the other hand have the retort that the Shropshire and Oxford Down sheep which spread the grey hairs through the flock pay in mutton for the mischief they do in wool. Yet it is certain that farmers will be profoundly discontented with wool prices if they insist on using these grey sheep as sires.

* * *

Twenty-five years back an English dress goods manufacturer bought a cloth-folding machine at secondhand and worked it regularly until January last, during which time it did everything required. Possibly the builder had gone out of business and at all events it was given to a dealer to repair and for a payment of three dollars he made some readjustments, putting in a new strip of cardclothing to replace the worn-out card at the nip. Unhappily the card wires were appar-

ently set pointing in the wrong direction and the machine was only used for goods going out to dye. Not until after dyeing was it discovered that there was a damaged place occurring every three yards throughout one batch of pieces. The dyer was sent for, accepted responsibility for the claim. A second batch returned from a different dyer was found similarly spoiled and the second dyer

FIG. 1.

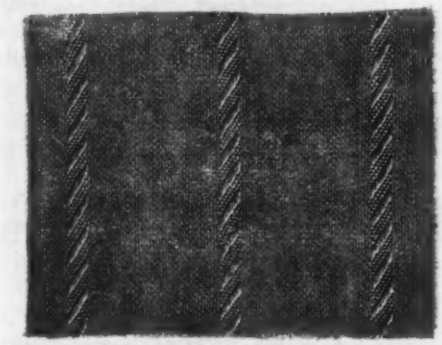


FIG. 2.

accepted the fault. Then the manufacturer examined his machine and found the card teeth pushing away the filling from the warp. By that time goods worth $6,000 had been damaged and a net loss of $2,000 apart from inconvenience and loss of trade had accrued. A lawsuit followed in which the jury disagreed and at a moderate estimate this brings the net damage to $3,000 to date. Thus, half way through the trouble, there has already been sunk as much as would buy ten new folding machines with rubber grips and no barbarous teeth to stab into delicate fabrics. Meantime the machine that has been answerable for so much, doubtless has claims to rank as the most expensive of its own kind in the world.

* * *

Cotton weavers to the number of 120,000 are asking for a 5 per cent. advance and are likely to get part of it. They have won increases amounting to 7 1/2 in the last ten years, but the improved rates have not prevented the shortage from growing greater.

FIG. 3.

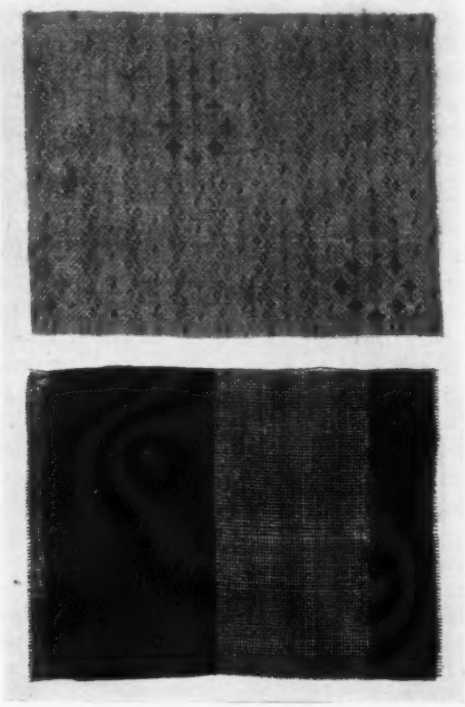


FIG. 4.

Weavers are wanted almost in every district in which light weaving is carried on. At Colne (Lancashire) where there is a fancy cotton trade, terms have been made as to the extras payable on goods containing artificial silk. The extras range from 10 to 20 per cent. accordingly as the silk is twist or weft and present in filling or in warp.

Artificial silk finds work for so many light looms that a few examples of the type of fabric made with it are here submitted. Fig. 1 perhaps shows the material at its best as striping on a voile made with two-fold cotton warp and a light single worsted filling; this cloth costs in Bradford 22 cents, 40 inches wide. In Fig. 2 both filling and warp are cream cotton with as much artificial silk as will form the cream filling-floats which constitute the figure; the maker's price is 21 1/2 cents. In Fig. 3 a two-fold cotton warp is crossed entirely with an artificial filling, producing in this design a brilliant effect and costing 27 1/2 cents. A Jacquard style is shown in No. 4 woven on a ground of cotton voile. Goods of this type, made with viscose silk in a loose weft twist, are having a capital season for evening wear. The effect is the most tasteful where ground and stripe or figure harmonize in shade.

* * *

According to present intentions a textile machinery and accessories exhibition similar to the one recently closed and under the same management, will be held in Manchester three years hence. The first of the series is said to have yielded good inquiries and some solid business. In reference to an allusion made already to the hostility which at first greeted the project for a privately-promoted undertaking, the editor of the Textile Recorder explains that his journal did not share this distaste. After explanations from the promoters and assurances from a number of machine-making firms, his journal volunteered its cooperation in a new undertaking which was successfully carried through.

In 1530, the spinning-wheel was introduced into Europe. It was made after the spinning-wheel which had been in use in India from time immemorial. The spinning-wheel about the time of Henry 8th was used in almost every household in England. Every young woman, whatever her position in life, was taught to spin with this machine; hence the origin of the term "spinster," as applied to an unmarried female.

DIFFERENTIAL MOTIONS

Boston, Mass., Dec. 22, 1911.

Editor Textile World Record:

In your December issue is an article signed "Differential" wherein the following statement is made:

> As regards the various kinds of differential motions, that shown in Fig. 1 (October issue), of your article, is the old "Holdsworth" or "Sun and Planet" motion, and is now out of date, having been superseded by the one shown in Fig. 2 of the same article, and many others.

The statement that the "Holdsworth Motion" is now out of date is erroneous, as it is very much alive and is being used by the majority of roving frame builders of America, with great success.

Of late years the motion has been greatly improved in its mechanical details, but not in principle. One of the most valuable items was the insertion of a bushing or shell, between the sleeve gear and the main shaft, in such a manner as to reduce the friction at that point to a minimum.

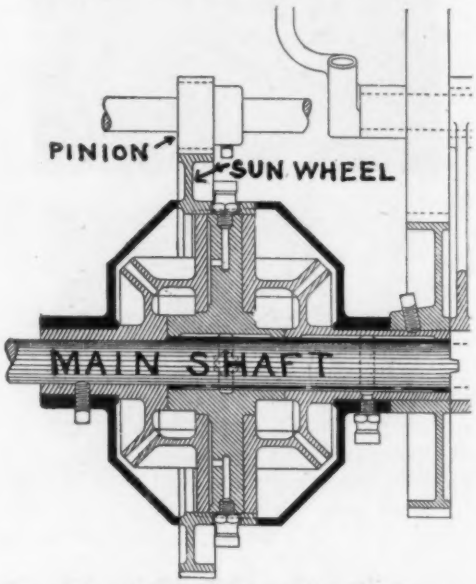


FIG. 1. SECTION OF IMPROVED COMPOUND.

The bushing for the reduction of the friction between the sleeve gear and main shaft is shown by the heavy black lines next to the main shaft, Fig. 1. This bushing does

not revolve, but is fastened in such a way that the main shaft is free to revolve on the inside, while the sleeve gear revolves free upon the outside and these in opposite directions, without touching each other. The bushing is chambered upon the inside and provided with oil grooves in such a manner that it becomes self oiling.

Another feature of the improved compound that commends itself is the size and diameter of the gears that compose it. The sun wheel is of a large diameter, with fine pitch teeth. This gives the small pinion that drives it, in transmitting motion from bottom cone, a large leverage. This leverage, which does not occur in any other compound, relieves the strain on the cone belt very materially.

The other gears are also large, hence we get a good wearing surface, with plenty of room for well proportioned bearings.

The assembled parts form a very firm and steady running compound and one that will run for years without perceptible wear. It performs its function of adding the variable speed of the bottom cone to the positive speed of the main shaft in a positive and easy manner with no excess of friction.

Thus, instead of the "Holdsworth" compound being out of date, we consider, and our judgment is based upon experience, that it is very much up to date and performs its work in a most satisfactory manner.

Fay H. Martin.

Editor Textile World Record:

In reply to "Differential's" criticism of my article in November issue, I will say, after rereading my article on differential motions, that he appears to have misunderstood the explanation given by me. The object of the differential motion, or "compound" is as I stated. It receives motion, at a constant speed, from the main shaft of the fly frame, which causes a speed to the bobbins equal to the speed of the spindles and it also receives motion, at a varying speed, from the bottom cone and combines this varying speed with the constant speed obtained from the main shaft into one speed, which is delivered to the bobbins. The speed of the bobbins gotten from the bottom cone and depending upon the position the cone belt occupies, is spoken of as the "excess" or "winding" speed of the bobbins and depends solely upon the motion given to the compound by the bottom cone for its existence. The bottom cone, through suitable management and connections, drives the sun-wheel and this motion of the sun-wheel causes the sleeve gear to revolve faster and gives the increase to the speed of the bobbins necessary to wind on the delivery of the front roll. This arrangement is absolutely essential to the practical operation of the fly frames, as the winding speed of the bobbins varies irregularly from start to finish of a set. The cones are used to get this irregular variation in speed and the compound is used to combine this varying speed with the constant speed of the main shaft. I did not mean to convey the impression (nor do I think I did), that the bobbins were driven entirely through the agency of the bottom cone, but that only the "excess" or winding speed of the bobbins was thus obtained.

Take a concrete illustration: A frame is running 4 h. r., with a spindle speed of 1100 r. p. m. and a bobbin of 2 inches in diameter. The amount of roving delivered would be approximately 458 inches per minute. Then the "winding" speed of the bobbin would be: $458 \div (2 \times 3.1416) = 72.9$ or 73 r. p. m. The total speed of the bobbins would be the spindle speed plus the "excess" or "winding" speed, or 1173 r. p. m., but only the "excess" speed or 73 r. p. m. would be gotten from the bottom cone, the remaining 1100 r. p. m. coming from the main shaft, the total bobbin speed of 1173 r. p. m. plainly being the result of the combining of the two motions of the main shaft and bottom cone by the compound.

If you take into consideration the fact that the bottom cone also drives the rail or traverse motion, which decreases in speed as the excess bobbin speed decreases and not as the total bobbin speed decreases, it will be seen that it would be rather difficult, to say the least, to design a set of cones that would give correct results in both cases.

The types of differential motions I selected for explanation are those most commonly found in use in this country. The statement, "As regards the various kinds of differential motions, that shown in Fig. 1," the old bevel gear type as I called it, "is now entirely out of date, having been superseded by the one shown in Fig. 2, and many others," is not correct. The old bevel gear compound, or "Holdsworth's motion," is today, I believe, being made and used on fly-frames in this country by more cotton machine builders than all other types. The reverse is true with English builders as, I believe, none at all use this type of compound now, still this does not necessarily mean that it "is out of date."

B. M. PARKER.

THE SACK-TREE

BY LOCK HAVEN

The sack-tree (*Antiaris toxicaria* Leschen.), also called upas tree, is one of the most remarkable forest trees in the world. It is the largest evergreen tree in the forests of Ceylon and the western coast of India and sometimes reaches 250 feet in height. It is called sack-tree because the thick inner bark furnishes material for very strong and elastic sacks employed chiefly in carrying rice. The strong fiber obtained from its bark is used also for making cordage. The trees selected for the purpose of making sacks are about one foot in diameter; larger ones, which sometimes measure from four to five feet or more in diameter, are not so suitable. The natives always avoid cutting very old trees and the reason for this can be easily explained. In exogenous trees, which increase in thickness by the addition of a thin layer of wood between the bark and the wood, the outer portion of the bark dies, opens in fissures and diminishes in thickness by exfoliation. Consequently the bark of old trees of this species is too thin and not available for sack making.

When a tree has been selected it is cut down and the trunk and large branches are divided into sections of the required size. The bark is then thoroughly beaten with a stone or club, until the parenchymatous layer (growing cell tissue) comes off, leaving the inner bark (bast) attached to the wood, which is then separated by simply drawing it off by hand. The bast or inner portion of the bark thus obtained is of a fibrous structure, remarkably tough, presenting the appearance of a woven fabric, like that of a stocking. This is next sewn into sacks, which are filled with sand and dried in the sun to expand. These sacks are so durable as to last ten or twelve years. They are generally suspended in smoke until ready for use.

Another mode of separating the inner bark is by a process nearly similar, only the tree is not felled, but incisions are made in the stem, one above another, a space being left between according to the desired length of the sacks. After the part of the bark to be removed has been beaten, two lateral incisions are made, leaving narrow strips on both sides intact, and the fibrous or best portion is removed in long strips and sewn together into sacks. By this method the important physiological function of the tree itself is still performed by means of the narrow, vertical strips of bark that are left on the trunks.

SPLIT LAPS ON COTTON CARDS

BY BRISTOL

The splitting of laps when being fed to the cards is one of the most annoying and perplexing troubles to be met with in cotton manufacturing. After having made every effort by means of the doublings and the evener motion on the intermediate and finisher pickers to obtain a finished lap just as even in weight, yard after yard, as it is possible to make, and then to have all this uniformity destroyed by laps "splitting" or "licking," which causes one part of the lap to be too thick and another part much too thin, is a very serious matter. The irregularity in the lap is sure to be found in the card sliver, and to a certain extent all through the mill to the finished goods. Overseers who have had to contend with this annoying subject have tried all kinds of ideas and devices to overcome, or at least partially prevent, this trouble. Perhaps the

most prevalent cause of laps splitting is using too large a proportion of roving waste, or drawing waste, in the cotton mixing. There is no stated rule as to the correct speed for the fans, the setting of the dampers or the size of conductor pipes, as the conditions are different in nearly every mill, owing to the location of the picker room, bends in the dust pipes, size of the dust pipes, and the location of the dust house.

Some machine builders make pickers having one screen larger in diameter than the other to cause more cotton to be deposited on one screen, which makes the sheet contain layers varying in thickness. This is considered to be an improvement.

Adjusting the speed of the fans has often given good results. Reducing the speed has sometimes been found to improve matters, and in other cases increasing the speed has had the desired effect. Setting the dampers in the flues on the side of the pickers to conduct the cotton in a greater amount to either one of the screens has proved effective. Patience and trying many experiments along these lines will usually improve the work. In some mills as a last resort roving has been run along with the lap sheet, on the finisher picker, but this is an expensive and troublesome method. A wooden creel, large enough to hold three or four slubber or intermediate strands is fastened above the calender rolls on the finisher picker, and the ends of roving are run along with the lap sheet. Owing to the cost of the roving used, and the time required to get roving and return empty bobbins, this method should not be resorted to when it is possible to overcome the trouble in any other way.

Some very good attachments for the prevention of lap splitting have been put on the market in the last few years. One device consists of a number of brass prongs or fingers cast together and secured to the polished plate between the cages and the top calender roll. These are set so that the pressure of the fingers against the lap cause a number of slight furrows or grooves about two inches apart to be made across the lap for its full length, and these furrows or slight depressions cause the lap to unwind without splitting.

DEPRECIATION IN TEXTILE MILLS

BY WEBEREI

The question of depreciation in textile mills is one of great importance, since it cannot be separated from the question of profits. By depreciation is meant an allowance in respect of apparent or non-apparent, non-repairable and non-remediable deterioration of machinery and plant due to age, obsolesence and expiration of patent rights, so as to provide funds for replacement. This allowance should be made over and above all expenditure for maintenance and repairs, as these latter should be charged to revenue. In general mill owners have to consider an annual charge for: (1) deterioration; (2) renewals; and (3) obsolesence, including reduction of earning power.

Depreciation arises from the following factors: (a) wear and tear, which is really natural wastage; (b) the reduced cost of similar machines on the market owing to improved methods of production; (c) expiration of patents where special machines are employed; (d) obsolesence; and (e) changes of fashion and trade. The fourth factor, obsolesence, may arise out of improvements in the machines or in the process of manufacture; the introduction of entirely new methods of production; and the introduction of new machines for the same process which either economize labor or increase production. It is not an easy matter to arrive at a correct decision as to the proper amount which should be written off or set aside each year for the depreciation of machinery and plant in general. There are, however, five factors that must be taken into consideration. These include the cost of the machine; its probable life; the extent and value of the repairs entailed; its value as a productive machine; its value as a non-productive machine or as scrap; and its obsolesence. This latter factor does not apply largely in textile mills, but a good example is afforded by an artificial silk works where new processes and appliances are being constantly introduced.

In connection with this estimation it must be borne in mind that the ratios of depreciation in textile mills will vary considerably. The care and amount of expenditure on renewals and upkeep of machinery, the class of foremen and operatives in general as regards their skill in handling the machinery and the expert and definite arrangement of the machinery play an important part. In this latter respect it follows that looms or spinning machinery erected upon an uneven and badly prepared floor will depreciate much more rapidly than those erected upon a properly leveled surface. Cleanliness is also an important factor, for the presence of dirt in bearings affects the life of a machine; it affects also in some respects the class of product and it certainly has its effect upon the operative who, working under bad conditions, produces a smaller quantity of material of a lower quality than under good conditions. The cost of lubrication is also affected by the working conditions, while indifferent or careless lubrication of machinery is a factor that cannot be disregarded. There are various methods adopted in arriving at the amount of depreciation to be allowed. In general these involve the provision of: (a) a fixed sum; (b) a fixed percentage of the original cost of the machine; (c) a fixed percentage on the yearly diminished value of the machine; and (d) a sum estimated to cover repairs, renewals and depreciation. In many textile mills it is common to provide a fixed sum to cover all the machinery, which is in many cases arrived at by a rough and ready method that must be deprecated. Those manufacturers who make a liberal provision in respect of depreciation are much better able to keep pace with the improvements which are constantly being made in the efficiency and design of machinery, than are those who adopt a niggardly cheeseparing policy. It is best in all cases that any estimates as to the economic life of a machine should be made by an expert and each class of machinery should be dealt with separately. The economic life should be estimated when the machinery is purchased and then an equal sum should be deducted each year so as to reduce the cost to scrap value by the end of such period; or the depreciation may be calculated on the diminished value or "compound depreciation" system. It must, however, be borne in mind that machinery should earn a profit after providing a reserve for its replacement.

The following particulars of depreciation for various textile mills are for average practise and are based on groups of machines. The individual treatment of textile machinery is seldom attempted. The particulars leave a residual value of about 10 per cent. and the working life is based on a normal week's work of not more than 70 looms:

Approximate Life Years	Class	Approximate Depreciation on Original Cost	Approximate Depreciation on Diminishing value
50 to 60	Substantial Buildings	2	5
22½ to 35	Steam Engines and Boilers	3½	8½
15 to 25	Gas engines, dynamos and motors	4 to 6½	10 to 15
25 to 35	Shafting, Pulleys, etc.	3½	8
5 to 10	Belts and Ropes	17½	30 to 40
25 to 35	Cotton and Woolen machinery including spinning and weaving machinery	3¼	9
6 to 10	Spinning and weaving accessories as cans, bobbins, shuttles, heddles, reeds, etc.	14	25 to 35

Take the case of belting which has say an average life of about five years with a depreciation of 17 1/2 per cent. on the original cost and about 35 per cent. on the diminishing values. We will presume that the first cost of belting in a spinning mill winding room was $1,000. Then the following table gives the depreciation figures side by side for the purposes of comparison. The intermediate figures are not of great importance, but it is essential to note that in five years the residual value equivalent to about 10 per cent. of the original cost is reached.

on original cost		on diminishing value	
First cost	$1000		$1000
Less 17½ per cent	175	Less 35 per cent.	350
End of first year	825		650
Less 17½ per cent on original cost	175	Less 35 per cent.	227.5
End of second year	650		422.5
Less depreciation	175	Less 35 per cent.	147.5
End of third year	475		275.0
Less depreciation	175	Less 35 per cent.	96.25
End of fourth year	300		178.75
Less depreciation	175	Less 35 per cent.	62.75
End of fifth year	$ 125		$ 116.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

OXIDIZED BLACK ON HOSIERY

Editor Textile World Record:

What will give an oxidized black on hosiery a good bluish cast and a soft feel? Is anything after in sulphur black that will make the goods tender after they lay in boxes for some time?

Lenox (1962).

To produce an oxidized black on hosiery, and to have a blue tone, requires that the dyer should use a grade of aniline oil or aniline salts possessing the property when dyed of giving a black which has such a blue tone. As dyers are not, as a rule, competent to make the exact chemical test to determine the shade giving value of a sample of either oils or salts before using, it devolves upon them to top off their dyeings with either a blue or blue shade of violet to give the desired shade, but it is needless to remark that this topping only remains until the hosiery is washed for the first time when it is completely removed.

Fast black dyeing requires more experience than any other branch of the trade, and it is useless to give a formula with the expectation that it will prove a success the first time it is tried. However, the following formula in daily use in a large mill doing high class work should prove of interest.

Prepare a stock solution as follows:

Aniline Salt	lbs.	130
Acetate of Copper	lbs.	6
Muriate of Ammonia	lbs.	12
Bluestone	lbs.	40
Chlorate of Potash	lbs.	30

Dissolve completely, and dilute to 14° Tw.

Put the stockings to be dyed in the tomtom, cover with the stock dye solution, and pound for 1 hour, then whiz for 3/4 of an hour (running the whizzed liquor back to the stock tank). Give the stockings a run for 3 hours at 80° to 90° F. in the revolving cages, when they should change to a dark green. Keep your eye on the temperature, for it is during the oxidizing in the cages that any injury will be done. Now remove to the ageing room and spread out over night, allowing free access of air, and in the morning put through a bath with 5 per cent. of bichromate for 30 to 40 minutes. Then wash well, extract and board.

A soft feel is always imparted by giving a light soap treatment with the last rinse, and some "softeners" are only ordinary soft soaps.

Sulphur blacks on cotton will not become tender if the latter after dyeing are thoroughly rinsed and to the last wash water add 6 ounces of acetate of soda per 10 gallons. Do not afterwards wash. This treatment will effectively prevent the tendering of cotton hosiery or other material dyed with the sulphur blacks. Beta Napthol.

In order to obtain the bluish cast to oxidized aniline black, resort is often made to a topping with a minute quantity of methylene blue. This dyestuff is usually applied at the same time with the softener. The softener may consist of one of the proprietary cotton softeners of good grade or may consist of olive oil emulsified with a little soda ash and soap. About 2 per cent. of olive oil on the weight of the goods may be used, with 1 per cent. of soda ash and 1 per cent. of olive oil chip soap. To this bath may be added sufficient methylene blue well dissolved to give the desired bluish cast to the black. The treatment in this bath may be carried out lukewarm.

Regarding the tendering of goods dyed with sulphur black. There has been a great deal of discussion ever since the sulphur blacks have come to be so largely used re-

garding the cause of the tendering or weakening of cotton fabrics which have been dyed with this color. The most conclusive researches on this point have led to the opinion that the tendering effect is due to the formation of sulphuric acid arising from the oxidation of the free sulphur which is to be found in the majority of sulphur blacks on the market. This sulphuric acid does not seem to originate from the sulphide of soda which is used in the dyeing process. Sulphur blacks are of more or less unknown composition and they probably consist of a mixture of different substances, among which are free sulphur and bodies which on ageing in the air decompose to yield free sulphur. This sulphur in the presence of air and moisture gradually tends to form small quantities of sulphuric acid and this gradually rots the fiber. To avoid the tendering action of sulphur black dyed material, many suggestions have been made, both by the manufacturers of dyestuffs and by chemists independently. Treatment with sodium acetate after dyeing has been suggested. Also a scouring in a weak soap bath. Also a treatment with a weak bath of sodium sulphide has been suggested, the idea in this latter case being to remove the sulphur compounds which appear to be soluble in the sodium sulphide. If the sodium sulphide treatment is resorted to, it should be given about 12 hours after the material has been dyed, that is to say, the material, after dyeing and washing with water, is allowed to stand over night and is then run through a bath containing about 3 per cent. of sodium sulphide using the bath at a lukewarm temperature, then rinsing and drying. Another process for the prevention of the tendering which has been suggested of recent years, is the precipitation on the fiber of calcium tannate. This is brought about by giving the dyed goods first a bath of tannic acid or sumach extract, using about 5 per cent. of sumach or 2 per cent. of tannic acid on the weight of the goods and then following this treatment with a bath containing about 5 per cent. of milk of lime. The tannic acid absorbed by the cotton will combine with the lime in the second bath and cause an insoluble precipitate of calcium tannate to be formed in the fiber. This calcium tannate is not removed from the goods by washing, as is the case with sodium acetate, and if there is any free sulphuric acid formed in the goods subsequently it will immediately combine with the calcium tannate, becoming neutralized thereby and thus the tendering effect is prevented. The treatment with sodium acetate has really this same idea in view, that is to say, it was to serve the purpose of neutralizing the free sulphuric acid by interaction between the acid and the sodium acetate resulting in the formation of sodium sulphate or Glauber salts and free acetic acid which, being volatile, soon passes away and does no injury to the cotton. As already pointed out, however, the defect in the use of sodium acetate as an after treatment lies in the fact that this salt is readily soluble in water and while it may serve its purpose the goods are being stored before sale, nevertheless the first washing such goods receive will, of course, remove all of the sodium acetate and then it is possible that the tendering effect may subsequently become evident. Hertford.

FINING FOR IMPERFECTIONS

Editor Textile World Record:

Will you please advise me as to what the statute in Massachusetts is concerning prohibiting the imposition of fines for weavers on account of imperfect work, and if there is a similar law in any other state? Manufacturer (1974).

The statute to which you refer is probably

"Acts of 1911, Chapter 584.

"An Act to Prohibit Employers from Imposing a Fine for Imperfections in Weaving.

"Section 1. No employer shall impose a fine upon an employe engaged at weaving for imperfections that may arise during the process of weaving.

"Section 2. Any employer who violates the provisions of this act shall be punished by a fine not exceeding one hundred dollars for the first offence, and not exceeding three hundred dollars for any subsequent offence."

Manufacturers can no longer impose fines

for imperfections, but in many mills notices have been posted, giving the price paid for first quality cloth and also price paid for second quality cloth. There has been a question raised as to whether or not this is a violation of the provisions of the Act above quoted. A test case is now before the Massachusetts Supreme Court to determine this point. We are informed that a decision was rendered by the Supreme Court in 1892, in a somewhat similar case in which the right of an employer to grade his scale of payment according to the quality of work produced was held to be legal. We believe that there have been "Fining Laws" passed in other states but to the best of our knowledge, they are practically dead letter. If this is not the case, we should be glad to learn of any state where the imposition of fines is legally prohibited and the law enforced.

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MACHINERY REQUIRED FOR KNITTING SWEATERS

Editor Textile World Record:

Please give us a list of the machinery required for manufacturing men's sweater coats, and the cost of same. Spinner (1967).

This inquiry does not state what kind of a sweater coat is to be manufactured, but the following estimate is made for a shaker sweater with a production of 15 dozen per week. This same plant would also give a production of 8 dozen of auto coats a week, which are a great deal heavier. The following is an estimate of cost.

2 Knitting Machines about	$900
1 62-End Skein Bobbin Winder	100
1 Button-hole Machine	300
1 Button Sewing Machine	275
1 Three H. P. Motor	275
1 Sewing Machine table	10
Knitting Machine Shafting Hangers	20
Belting	8
Total	$1,888

These figures will vary according to different makes of machinery. The varying prices and incidentals may run the total up to about $2,500. These estimates are taken from such machinery as I am at present in charge of. The actual floor space for knitting machines, leaving room to get around, is 16 by 12 feet, and the winders occupy 8 by 6 feet. The total floor space to cover machinery, finishing, knitting, shipping and yarns would be about 40 by 45 feet. Delmar.

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BLEACHING HOSIERY

Editor Textile World Record:

What are the methods most commonly employed in bleaching hosiery? What is the cheapest, the lime, peroxide or electric process.

Bradford (1971).

For the bleaching of cotton hosiery of the ordinary grades the most common and notably the cheapest method is to use bleach liquors prepared from chloride of lime. The hosiery should first be boiled out with alkali in a suitable kier, or if such is not available, it may be boiled in a washing machine for 2 to 4 hours with 2 per cent. of caustic soda and 2 per cent. of soda ash, calculated on the weight of the goods. The material is then thoroughly washed and is treated with a chloride of lime solution of 1 1/2° Tw. This treatment is carried out in the cold and should be for a period of about 1 to 1 1/2 hours. The goods should be kept immersed beneath the liquor during this time. Then a thorough washing should be given with plenty of fresh water, and the excess of chlorine compounds may then be removed by treatment with a bath of anti chlor (sodium bisulphite) using about 5 per cent. of the sodium bisulphite liquor (36° Be.) on the weight of the goods. This bath is used cold and for about one-half hour. A very thorough washing is then given the material for the purpose of removing all the chemicals and the bleaching is finished. Should it be desired to give the color a bluish tint, a final finishing bath may be given in which a small amount of bleacher's tint may be employed together with 1 to 3 per cent. of cotton softener. This bath is maintained at a lukewarm temperature (120° to 140° F.) for one-half hour and the goods are then taken out and extracted without further washing.

A softer bleaching can be obtained by using a solution of hypochlorite in place of the chloride of lime liquor. Sodium hypochlorite can be obtained in ready-made form as a solution in carboys. In this form, how-

ever, it is quite expensive compared with chloride of lime. It can be made, however, by the bleacher himself very readily from a solution of soda ash and liquid chlorine. The latter is now available on the market at a cheap price and forms a very convenient and easy method of preparing bleaching solutions of sodium hypochlorite.

Sodium hypochlorite may also be prepared by the electrolysis of a solution of common salt. This requires the installation of an electrolyzing outfit and if electric energy is available at a cheap rate, the electrolytic method is a very convenient and cleanly method of handling the preparation of bleach liquors.

The method of bleaching with peroxide (either sodium peroxide or hydrogen peroxide solutions) is excellent but more expensive than the method of bleaching with hypochlorites, either of lime or soda. For the ordinary and low grades of cotton hosiery the cost of peroxide bleaching would probably be too great, but where fine grades are being operated on and also where the goods consist of mixtures of cotton and wool, or cotton and silk, then the peroxide bleach may be used with advantage.

J. Merritt Matthews.

UNEVENNESS IN SELVAGE TWILL

Editor Textile World Record:

Can you inform us the reason why the selvage on our goods shows the twill more distinctly on one side of the loom than on the other? Is it in the dressing of the warps or is it because there is no weight on one side of the beam?

Selvage (1973).

If we understand your inquiry correctly the selvage appears to show a more prominent twill on one side of the cloth than on the other. I do not know of any way that this would come from the dressing of the warp, nor would weight on one side of the beam only cause this, unless you had the old fashioned looms where the arbor of the beam is not fastened in by a cap on the box. See if the twill does not show more prominently on the side of the loom where the eye of the shuttle is nearer the entrance of the shuttle box. If you find that it is, the shuttle is rebounding or there is not friction enough on the filling in the shuttle or there is too much power on the opposite side of the loom which causes the shuttle to rebound. This would also be the cause if the trouble was on the side of the loom where the shuttle eye was at the extreme end of the box if there was not friction enough on the yarn or too much power on the opposite side of the loom, but not so liable to occur as in the first instance.

It might be well to see that the shed on the loom closes early on the filling, not too much so that it would cause it to kink on the selvage. Run the loom with as little power as possible and see that the shuttle binders are holding the shuttle not too tightly when in the shuttle box. C. T. D.

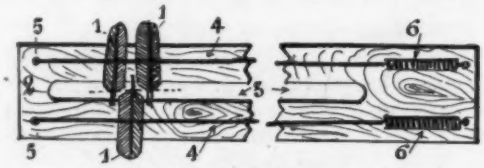
THE MANUFACTURE OF MARABOUT

Editor Textile World Record:

Kindly explain the process used in the manufacture of marabout? Manufacturer (1965).

Our French correspondent replies as follows:

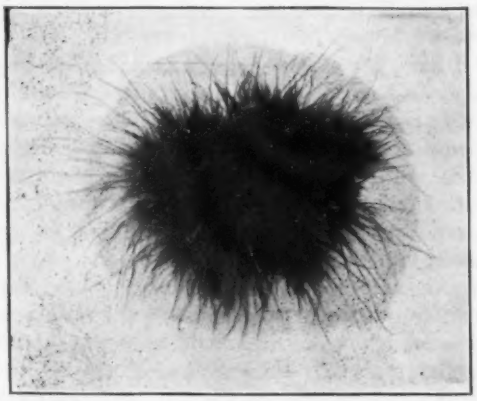
These goods are made exclusively at Paris. The feathers are cleaned in a solution of soda and rinsed before dyeing. They are also treated in a boiling solution which



SHOWING ARRANGEMENT OF FEATHERS ON PLANK IN MANUFACTURING MARABOUT.

is either neutral or contains sulphur or acetic acid, according to the color desired. The feathers are dried in a rotary machine. The dyeing is done by small custom establishments and the prices are regulated by a standard list. The feathers are sorted according to quality and length by the manufacturer of the marabout. The cost of a boa depends chiefly upon the weight of the feathers used. The manufacturer weighs carefully the feathers that are required for each boa. The feathers are then arranged by hand on a plank, shown in the illustration, and which is about 7 feet long. The

feathers, 1, are laid on each side of the plank, 2, with the point of the feather projecting and enters lengthways as shown. The feathers, 1, are held in position by the cords, 4. One end of each cord is fastened at 5, and the necessary tension is obtained by means of a spring, 6, to which the other end is fastened. In this way the feathers are held firmly in position on the board. It is necessary to arrange the feathers at regular intervals on the board and have a length somewhat greater than the desired length of the boa. After the feathers have been placed in position the board is taken to an ordinary sewing machine and the feathers are stitched



A SAMPLE OF MARABOUT.

along the opening in the plank. The sewing machine is of the ordinary type, a rather heavy needle being employed. After the feathers have been stitched they are removed from the board and form a sort of flat chenille which is then twisted on a wheel simliar to that used for passamenterie and which was illustrated on page 142 in the April issue of the Textile World Record.

One of the ends of the boa being held stationary the twist is imparted at the other end. In this way a round chenille is obtained and the twist is fixed by baking the boa in an oven for several hours, care being taken to keep the temperature uniform. The baking process not only fixes the twist, but curls and swells the feathers. It is sometimes found necessary to impart more twist after the boa has been baked. The process is very simple and rather primitive, all the work being done by hand. The industry, however, is influenced greatly by fashion and there is slight inducement to improve the process. Gaul.

COTTON WAGES IN ENGLAND

Editor Textile World Record:

The Committee of Ways and Means have had before them a book, "Textiles," by A. F. Barker, on pages 323 and 324 of which are two tables purporting to give the average wages of seventeen classes of Lancashire operatives. The average is obtained by adding the weekly rates of wages together and then dividing. This seems to be wrong, because it takes no account of the number of operatives working in each class. Can you give me some reliable figures? Alloa (1944).

Our Bradford correspondent replies as follows:

The tables mentioned are not by Prof. Barker, but occur in a contribution by W. H. Cook. The method employed is good for its own purpose as an index showing the variation in wages over a term of years, but is of course insufficient as a guide for other purposes. It would be unfair to blame an author for the uses that his figures are put to by subsequent handlers. Unfortunately there are difficulties in the way of telling precisely how many operatives of each class are employed. The available official information consists of the British Census of Population (1901) and the particulars supplied with the Factory Returns (1904). The census deals with 529,131 persons employed in the cotton industry and the returns with 523,030 and they show the occupations as below:

Census

	per cent.
Cotton card and blowing processes	11.3
Cotton spinning	18.7
Cotton winding, warping, etc.	15.7
Cotton weaving	45.6
Cotton other processes	8.7

Factory Inspection

	per cent.
Cotton spinning and incidentals	40.1
Cotton weaving and incidentals	57.5
Cotton finishing	1.7
Persons in non-textile processes in cotton mills	.7

It will be seen that the tables agree in placing about 40 per cent. of the operatives in the spinning and incidental processes and about 60 per cent. in weaving, etc. The figures are at least official, whereas some of Mr.

Cook's clearly are not. That gentleman's figures refer to averages for Manchester and Oldham and show weekly averages as follows:

1856	1880	1905
14/6	19/10	26/2
$3.50	$4.76	$6.28

There is later information in the Report of the Board of Trade Inquiry into Earnings and Hours of Labor (1906) based on a return of the earnings of 41 per cent. of all the workpeople in the industry. According to this source the average of all classes of operatives was 19.5 ($4.66) in the last week of September, 1906 and the average wage of those who worked full time was four cents more. Regarded by districts of Lancashire and Cheshire the range was from 14/1 ($3.40) in the out-districts to 23/10 ($5.72) in Burnley, the largest weaving town. This official average is arrived at by the same method as the figures quoted in the book "Textiles" and derived presumably from private sources. The private figures relate merely to one district out of many and are at variance with those published by the Board of Trade. Taking the industry all round:

Foremen and assistants					40/7 $9.74
Mixers					21/6 5.16
Scutchers					25/7 6.14
Grinders					29/3 6.98
Mule spinners (29/2 to 47/6)					41/2 9.88
Piecers, big					18/4 4.40
Piecers, boys					16/6 3.96
Piecers, little piecers					11/11 2.84
Sizers, tapers, slashers					42/8 10.24
Warp dressers					36/10 8.84
Weavers:	6 looms	4 lms.	3 lms.	2 lms.	Aver.
" Men	32/10	24/11	19/6	21/7	25/4
	$7.88	$5.98	$4.68	$5.18	$6.08
" Women	30/7	23/5	17/8	13/10	20/10
	$7.34	$5.62	$4.24	$3.32	$5.00
Frame-tenters					19/4 $4.64
Ring spinners (piece work)					16/8 4.00
Reelers					13/8 3.28
Winders					15/3 3.66
Doublers					13/1 3.14
Beam warpers					20/9 4.98

The table given on page 323 of Prof. Barker's book contains elements which can only be the outcome of guesswork. The numbers of spindles, looms and operatives and the amount of exports are matters of public record. The yarn productions and cloth productions and the figures deduced from these are simply somebody's opinions and the somebody is not even named. There has been only one Census of Production taken in Great Britain and that in 1907 and the official census is at many points incomplete and inconclusive. The figures quoted by Mr. Cook may be better or worse, but they should neither be presented nor accepted as anything better than estimates made by an anonymous person.

James Strand.

TEMPERATURE IN THE CARD ROOM

Editor Textile World Record:

I am using the old wood top flat cards and had trouble last winter when starting up in the morning with the tops and cylinder rubbing. The room is warm enough in the morning but gets cold during the night. What do you suggest for remedying this difficulty? Greenwood (1955).

I have never run across a condition of this kind or heard of anyone who has. I should judge that the settings are very close and the lowering of the temperature during the night causes the frame supporting the flats to shrink enough to lower the flats until they scrape the cylinder. It might be well to try having the card room heated for one or two nights and see if this would remedy the trouble. If the setting between the flats and cylinder is very close a little widening would probably remedy the evil and cause no deterioration in the quality of the finished sliver. Steuben.

WEIGHT ON DRESSING SPOOLS

Editor Textile World Record:

Does the dressing spool require more weight when full of yarn or one-third full?

Parker (1972).

This question is better answered if we knew the quality of the yarn on the spool. If a good strong yarn is being dressed, more weight is required on the full spool than on the spool which is three-quarters run down. On tender yarn good judgment would have to be used in regard to the weight on the spool. It would require less weight on tender yarn when the spool was full than on strong yarn and the weight would have to be regulated as the spool runs down.

The latest improved spool racks on dressing frames have an improvement that weights the spool and gradually releases the weight as the spool empties. C. T. D.

Knitting Department

THE KNIT GOODS SITUATION

In our last issue we made note of the fact that buyers had not as yet shown any great eagerness to place orders for the fall of 1912 for knit underwear, and the same state of affairs continues to exist at this writing. As a result of the general apathy displayed by buyers, manufacturers of some lines are beginning to get uneasy and to shade their prices and in the judgment of the writer, this is hurting, rather than improving conditions.

The lowering of prices has occurred on several lines of men's ribbed and fleeced goods, and perhaps the most talked of reduction is that on the line of High Rock fleeced shirts and drawers which were opened at $3.25, but have now been reduced to $3.10. This concern shows a 13-pound line with wide Prussian binding at $3.25; another 13-pound finer gauge at $3.37 1/2; also a line of 13 1/2-pound at $3.50, in addition to which they show a 13 1/2-pound garment at $3.60, called the Defender brand, on which they ask the jobber to maintain the price of $4.25, 2/10 with dating, or $4.15 net 30 days without dating.

A. A. Smith & Co., who are the agents for the Hover Knitting Co. of Columbiaville, quote $3.25 on their line of 13-pound fleeces, and it is understood that a very satisfactory business has been booked on this basis.

The Utica Knitting Co. are offering a line of 24-gauge fleeced goods, the shirts made with satin band and trimmed with tubular cloth binding at $3.50. They also show a line of men's 12-pound ribbed shirts and drawers with pearl buttons on the drawers and set-in shoulder pieces on the shirts at $3.60.

Some reduction in prices of men's ribbed goods, that were made since our November issue, are the Fuld & Hatch Knitting Co.'s line of 11-pound plain and tuck stitch shown then at $3.37 1/2 that have now been made $3.25. These manufacturers have added a line of 12-pound goods in both plain and tuck stitch at $3.37 1/2.

The Mayo Mills have also reduced their prices on 11-pound single-thread goods to $3.12 1/2; the same weight in two-thread goods to $3.27 1/2, and on 12-pound single-thread to $3.25, and two-thread to $3.40. These are reductions of 12 1/2 to 20 cents from prices quoted in November.

There has been no reduction in the price of women's carded yarn goods and those weighing 6 pounds are still being quoted at $1.75, and 7-pound at $1.85. It is understood that the 8-pound waste garment shown early by the Union Mills at $1.90 has been withdrawn from sale.

Some very attractive values are shown in ladies' combed yarn goods by the great number of manufacturers who make this class of merchandise. A very sightly trimmed 7 1/2-pound garment may be had in peeler and bleached as low as $3.25. In most cases, this is about the same garment sold last season at $3.50 to $3.62 1/2. Nearly all of these manufacturers, however, are maintaining the price of $3.50 on the lines weighing 8 pounds with more expensive trimmings that get to the retailers for their standard 50-cent numbers.

As for women's combed yarn combination suits, they are being offered at prices ranging from $6.25 to $6.75, according to the weight and trim; those at $6.75 running full 12 pounds in weight and with more expensive silk trimming.

Most lines of worsted plated goods are being quoted at the same prices as they were sold last year, changes being made in the proportion of the stock going into the goods, the qualities being improved considerably and popular prices maintained.

There is no let up in the increasing demand for combination suits in all lines. One traveler writes from the West that aside from 25-cent vest and pant for women and 50-cent shirt and drawer for men, 80 per cent. of his business is on combination suits.

The more important manufacturers of full lines of men's combination suits are located in Ohio, and from a number of them may be had all grades from a cotton garment at

$6.75 to silk and wool lines at $42.00. One of these concerns show a line of men's suits made of merino face yarn at $10.50. At $13.50 quite a variety of good values in both tuck and plain stitches in worsted plated and worsted mixed goods are shown. Tucks are taken quite freely in the far West and Northwest, but in other localities, plain stitch lines are more often used.

Men's suit manufacturers in general have adopted the closed crotch feature for their lines for 1912. The Cooper Co. of Kenosha, Wis., and the Cooper Co. of Bennington, Vt., are working under one patent, the distinguishing feature of which is that the gusset runs down into one leg of the garment. Most of the other manufacturers have worked out another design without this particular feature, but for which a perfect fitting closed garment is claimed.

The Chalmers Knitting Co. have issued a circular letter, informing the trade that they have adopted the closed crotch feature for their line of Porousknit suits that are to be delivered after February first.

HOSIERY

Conditions in the hosiery market have changed some during the past month, in that duplicates on heavy weights have ceased, indicating that jobbers and retailers are cleaning up their stocks, but manufacturers have continued to be fairly busy getting out samples for 1912. Those who make light weights are working on spring orders.

The initial buying for spring was not large and duplicates have not come to hand in any great volume as yet. This causes many to predict that just as soon as the consumer begins to buy light weights a heavy duplicating business is sure to come.

Fall lines for 1912 are being shown quite generally on the road and in the smaller cities. Salesmen have found the local jobbers willing to place orders, but the larger centers, such as Chicago, St. Louis, St. Joseph and Minneapolis, are putting off the matter until January, when the buyers are all expected in New York to attend the convention and banquet.

Fleeced hosiery is being offered about five cents a dozen less than last year's prices and wool lines are in some instances five cents lower, but in many lines the qualities are being improved and prices maintained.

There is much talk to the effect that on occount of the advance in the price of raw silk, the various lines of silk hosiery are certain to be advanced as soon as any additional orders come forward.

There are many who await with interest the flooding of the market in the spring with the cheap silk goods that have been sold to retail at 25 cents. It is said that it is possible to produce a thread silk to meet this price, but that a number of manufacturers, seeking to increase their profits, are making their goods of spun and thrown silk or fiber silk and that after one washing, the consumers will be wending their way to the retailer with a complaint. It is just the class of trade that is looking for this merchandise who cannot afford to buy it, as there is no wear worth mentioning.

A SHANK BUTTON SEWING MACHINE

Knit goods manufacturers have always wanted a machine that could sew on shank buttons and covered buttons. The difficulties experienced in building such a machine have been overcome at last by the Union Button Sewing Co., Boston, Mass., in the manufacture of an entirely new machine for this purpose. The work done by this machine is illustrated at Fig. 1, which shows a variety of styles of shank buttons which were sewed on a knit fabric, the reverse side of the same fabric being shown at Fig. 2. It will be noted that the threads do not come through. The buttons are sewed on with an elastic stitch, and the thread is both knotted and severed by the machine, so that there is a great saving in the cost of putting on the buttons as well as in time. Although this machine has been but recently perfected, many advance orders have been received by the builders. One Western knitting mill ordered ten machines put in as quickly as possible. The manufacturers of different lines, including sweaters, sweater coats, baby

suits, Indian suits, etc., on which a number of shank buttons are sewed, are placing orders and urging the manufacturers to hasten the deliveries.

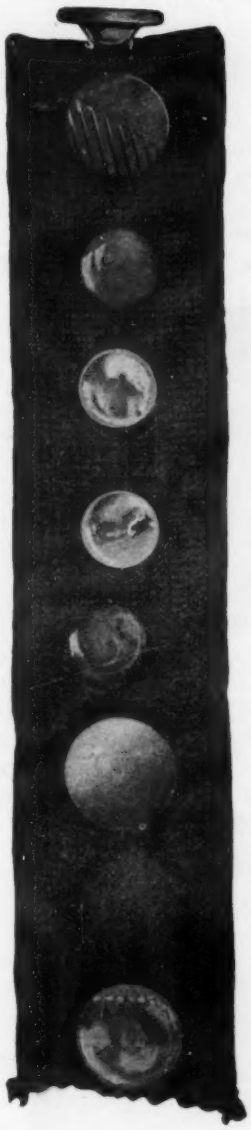


FIG. 1.

FIG. 2.

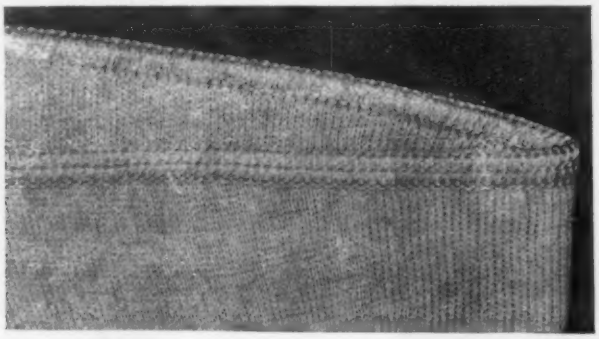
This new shank button sewing machine can also be adapted to sew on large hooks and eyes, such as are used on sweaters. Manufacturers will appreciate the value of a machine of this type, for on certain lines of garments, shank buttons or covered buttons are preferable to buttons having holes drilled through them, and the principal reason why manufacturers have not been able to use the shank or covered button is due to the fact that they have not been able to secure a machine that would sew this type of button,

and because of the great difficulty in getting satisfactory results from sewing buttons by hand.

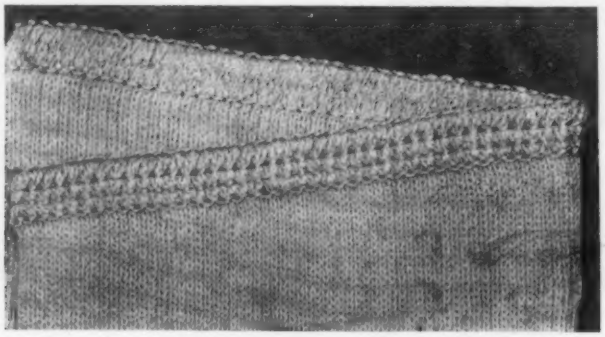
From the interest already shown and a knowledge of trade conditions, the builders of this machine anticipate that their capacity to produce machines fast enough to supply the demand will be taxed to the utmost during 1912.

AN ATTRACTIVE FINISH

The illustrations show styles of two and three-needle overstitch finish which a number of Utica mills are putting on their samples this season. It is made on a Metropolitan sewing machine known as style 26-J-A-C which can be used either as a two or three needle machine according to the requirements of the manufacturer. A similar finish has been hitherto employed on some high priced goods made in New England.



A TWO-NEEDLE OVERSTITCH FINISH



A THREE-NEEDLE OVERSTITCH FINISH.

SILK HOSIERY ON FULL FASHIONED MACHINES

BY WINWICK

The common practice of nearly all the mills engaged in the silk hosiery business is to purchase the tram silk in the skein. It is degummed, dyed and thrown with the proper number of filaments per thread. A slight twist of a few turns per inch is used where a beautiful soft finish is desired, while for hard wearing qualities a doubled and twisted thread would be most suitable. But woe to the man who attempts to knit stockings out of single ply with many turns of twist per inch. One firm in the United States is successfully knitting silk in the gum and boiling off and dyeing in the piece, yet the best hosiery is knit in the color and is known to the trade as ingrain silk.

Let us follow a pair of hose through the mill, beginning with the silk in the skein up

to the winding department. The skeins are placed on light running swifts from which the silk is wound on double-head spools with straight barrels. It is an operation which requires considerable skill on the part of the operative, particularly if the skein should have become slightly entangled in dyeing. It is important that these spools, and especially that the heads of these spools shall be smooth. On account of the clinging nature of the silk the smallest splinter or scratch might cause considerable waste. A second winding is necessary. It is impossible to knit on flat bar machines from straight barrel spools and impracticable to cone from swifts. The Universal No. 50 winder has a special dampening attachment for this operation; while being wound the silk is conditioned by being drawn over a slowly revolving roll which runs through an emulsion in a trough. The emulsion should be of a medium density, and there is no oil equal to olive oil for this purpose. This process deserves much more attention than it sometimes gets. Right here in the conditioning the manufacturer may make or lose his reputation and his money. It is all important that the silk should be just moist enough and not too moist. The cones should not be wound very large, or there may be trouble with surface friction in the knitting. They should be kept covered to prevent evaporation until they are put on the knitting machine. It is not a good plan to place wet cloth where it comes in actual contact with the silk; since the silk absorbs moisture so rapidly it would soon become too wet for use. Any uneven dampening or undue adhesion caused by the silk being too wet would cause the silk to knit unevenly. Enameled or cotton covered wood cones are best for silk. From the beginning to the end of the manufacture of silk hosiery the silk must be kept absolutely clean. Any stocking which should become stained in manufacture would pass into waste.

From the winding department the silk cones are taken to the knitting department and to the knitting machine known as the legger. The cones are placed on wire spindles in metal boxes at the back of the machines. Underneath the cone racks is a place for water to enable the knitter to maintain the right degree of humidity within the boxes. Each box holds ends enough for two machine heads and is provided with two sliding glass doors at the front to enable the knitter to watch and to exchange cones as necessary. Considerable difficulty was formerly experienced through the settling of the slack silk about the base of the cone at the end of the course, but this has been overcome by the use of a large felt washer at the base of each cone. In the tops of these boxes are porcelain eyelets through which the ends run to the knitting frame.

The frames are so large (an 18-section legger would be about 30 feet long) that the visitor is usually impressed with their size and strength and seldom realizes how delicate are the operations required to form and turn the minute stitches or transfer thousands of them during the fashioning process. The knitting frames were for many years run at a speed of 37 courses per minute on silk, but the modern machines are capable of knitting 42 courses per minute on the leggers and 38 on the footers. Much skill is required to keep these machines in perfect condition. This is necessary in silk knitting because a single stitch dropped in a silk stocking is liable to run down. They frequently run the entire length of the stocking.

When the legs are knit they are held up to the light and examined to determine whether the stitches are uniform in length and evenly turned. If the machine is in good working order and the silk thread in perfect condition we shall not be able to find any trace of cockling or what is sometimes called pin-hole knitting. Cockling at the knitting machine cannot be remedied by any subsequent process of finishing and this is the reason why so much attention must be given to the conditioning of the silk thread.

The next process is the footing. First the stockings are marked on the inside wale of each half heel with a bone marker and skillful toppers soon have the pair of hose on the transfer bars. Great care must be exercised at this stage of the work. To insure firm gusset corners the turn at the marked wale

must be square with the instep. Make sure that the bar course has not been crossed in the instep. Neither should the toppers be allowed to ravel roughly since the silk thread draws so easily when pulled.

It is always wise to use only a few courses of silk in topping, say 8 or 10 according to the class of work, both on account of the waste and to make the corners as strong as possible. The heels should be as long as the toppers can handle comfortably as a preventative of two-point marks, which so closely resemble drop stitches in appearance. A pair of hose is footed in about twelve minutes, and yet this operation is not so easy or simple as it looks. The least burr on any one of the thousands of needles, narrowing points, sinkers or knocking-over bits would have been sufficient to have ruined the hose, while a sudden change of a few degrees of temperature would have laid off the footer for repairs. A temperature of 70° F. has been found to be best adapted to silk knitting.

Now comes a careful inspection to discover any defect if such exists. Next is the looping. The two halves of the heels are deftly brought together and the toes doubled back at the diamond points and securely looped. Then comes the fast overseamer. This operation leaves the stockings wrong side out and ends the constructive work. Then in rapid succession come a careful clipping of ends, turning, the fastening of loose thread and the mending of stray stitches. The goods then go to the dye house or wash room for a cleansing bath to remove all trace of the emulsion used in the knitting room, then a thorough rinsing in cold water, drying at a low temperature, a gentle steaming, boarding, the boarder's hot press and the cold press for twelve hours.

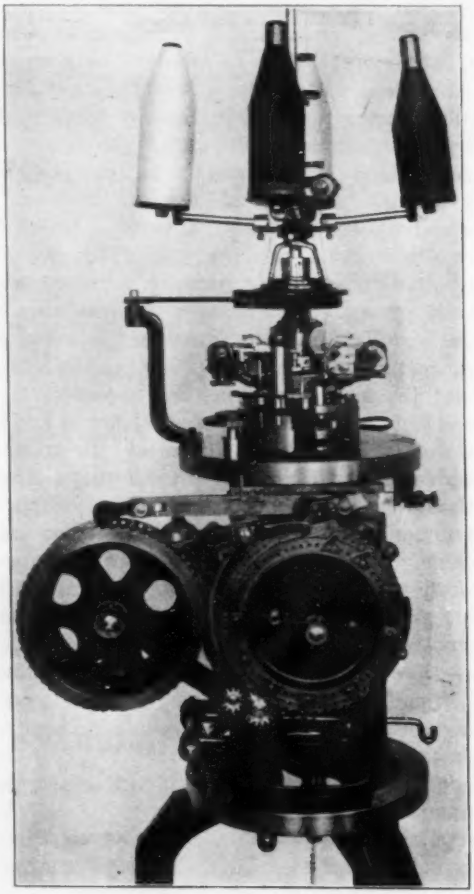
The goods are then taken to the finishing room. The finisher's inspection, matching, gold stamping, the labeling, folding, packing and shipping.

The finest flax in the world—the famous flax of the Courtrai region in Belgium—is retted in the river Lys, the grounds on both sides of the river for many miles being used as steeping grounds.

THE WILDMAN NECKTIE KNITTING MACHINE

Knitted ties made on the circular latch needle machine are attracting so much attention that a brief description of one of the latest machines for making them should be of interest. It is built by the Wildman Mfg. Co., Norristown, Pa.

Silk is expensive material and a tie is some 46 inches in length, so flaws and defects must be kept at a minimum or the loss due to seconds will eat up the profit on the firsts. The



THE WILDMAN NECKTIE MACHINE.

Wildman machine has a reputation for its accuracy and excellency of design and finish, which combined make a good beginning for reducing the number of seconds, but added

to that it has many novel features, some of which are entirely distinctive.

It has a chainless pattern mechanism, thus having the advantages of compactness, changeability without inserting or removing links, instant resetting at the beginning of the pattern, and control by cloth delivery instead of by revolutions. The new No. 2 automatic pattern attachment supplied on the necktie machines has two-thirds more range than the No. 1 attachment, but is only a trifle larger so it permits a big saving in space over that required by the long chains which are otherwise necessary for necktie machines.

The accordeon stitch is half cardigan with the large loops on the inside of the fabric. The small loops are thus left on the outside and they are made still smaller by putting tension on the untucked yarn. This tension makes every other course tight in the plain ribbing of the neck band, unless compensated. In the Wildman machine compensation is effected by automatically slackening the stitch of the yarn under tension enough to make the stitch of both feeds just alike.

Not only is the stitch drawn tight on one feed by yarn tension, but the stitch in general is also adjusted tighter than usual, consequently, it is desirable to hold the cylinder needles in the slots by more secure means than springs, which may allow the cylinder needles to bend outward when the dial needle is coming out through the stitch. The latest Wildman machines for making ties are provided with positive needle guards which prevent this displacement of the cylinder needles.

Silk is susceptible to impressions so that the lines caused by dogs or lugs are objectionable. The Wildman machine leaves the course of the webbing perfectly free. Not only does the Wildman dogless attachment eliminate the pressing of the fabric and stitch distortion, but it facilitates "hooking on," which operation needs facilitating, especially in knitting ties where the tightness of the stitch makes it reluctant to slip over the needle hook, and where the yarn is so slippery that it ravels instead of furnishing a good hold. The further advantages claimed for the dogless attachment are thus described by the manufacturers: "Uniform knitting is dependent on uniform conditions and one important condition is the fabric tension at the needles, which is not uniform where dogs are used since they pinch the fabric differently at different times and thus change the tension transmitted by the take-up. The Wildman machine described above has no dogs to interfere with the fabric. There is another fault of dogs, especially on small size cylinders; that is the magnification of the untrueness of the stem which increases the danger of needle interference. Take two necktie machines of any make, but equally good, one with dogs and the other without. Now, speaking generally, all stems run a little bit eccentrically, since it would cost so much to make them absolutely true that no one would buy the machines. Therefore, since these two machines are equally good, the stems of each are equally untrue, say as much as the diameter of a human hair, three thousandths of an inch. In the dogless machine the error at the needle line will be the same, three thousandth of an inch, but in the machine with the dogs the error at the needles will be ten thousandths or one hundredth of an inch. In other words, at every revolution the dial needles of the machine with dogs will leave their correct position and go out of their way half a hundredth of an inch on either side. This magnification by the dogs of the eccentricity of the stem is a scientific fact, the demonstration of which is as interesting as the fact itself is important, but the demontration is too long to be given here."

Stripers are of course used on one or both feeds except when ties of only one color are desired. These are the Wildman patent striper, compact and positive. The striper carries two differently colored threads. Suppose it is desired to make a black tie with red showing through between the wales. Then one feed runs black continuously, while the other requires a striper to change from red to black on starting the neck band and from black to red on finishing it. The tucking on the cylinder of this red thread throws it out of the face of the fabric and makes the accordeon. Bat or hobble ties are made by

stopping the tucking at intervals when knitting the body of the tie. This throws an alternate course of red into the body of the tie, unless the striper changes to black. If a distinct stripe is desired in the face, then a striper is required on the feed which has been running black. Say that the alternate thread added to the feed is green; by changing to this color when knitting the body of the tie a sharply defined green stripe is produced. A shadow stripe, visible only when the accordeon is spread apart, is caused by changing the color of the tucked thread; for instance, in this case, from red to black. Then both the face and back thread are black, and when the accordeon is spread, the black stripe shows in contrast to the red.

The illustration shows the machine excepting the stop motion and the legs. The stop motion is the well known Wildman device which is now manufactured for body machines as well as ribbers. The dogless attachment is seen on the cross bar. The stripers are at each side of the dial. In the foreground is the No. 2 chainless pattern mechanism, with the striper pattern wheel at the left.

THE MANUFACTURE OF SWEATER COATS

BY DELMAR

One of the most popular garments of today is known as the shaker garment, or sweater coat, and is made out of various sized yarns ranging from 2/13s to 2/21s wool and 2/13s to 4/15s worsted. This garment is made on a shaker machine with 2 1/2 needles to the inch. This sweater is made in tubular form. There are several parts which are knitted together by hand and when finished it looks as if it was all knitted by machine.

In knitting, the body of the garment is made about size 40, and 72 needles are set in the back and front of the machine. Then by setting the locks and cams in certain places it gives the first stitch on the top of the shoulder. Then these locks and cams are changed to another position and another yarn carrier is put in operation. By changing the locks and cams each bar is knit in separately for 50 courses which gives the armholes at the side with a selvage edge for the sleeves to be knitted to by hand. Then the locks and cams are set in a different position and the extra yarn guide is set aside when the machine knits tubular and you make 72 courses, when the machine is stopped throwing up 20 needles each side of the center. Then put in an extra thread and knit it off by hand. Then start the machine and knit 65 courses, of which 1 1/2 inches is turned up and knitted into a hem on the bottom of the garment. This finishes the body.

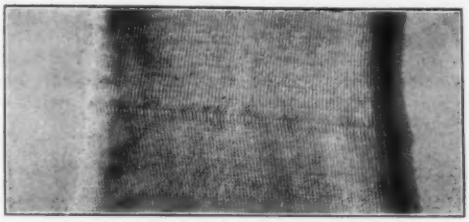
The sleeves are then knitted the same as the body of the garment, only tubular all the way, being shaped by a series of narrowings on the machine by the operator who lifts the stitches off the needles with what is called a narrowing comb, moving over one needle and thereby putting one needle out of operation. The machine is then started up and runs one or two revolutions when the above operation is repeated until a certain number is made, namely, if a size 40 sleeve was being made, 31 needles should be set in each bar and then the locks and cams set for tubular work, and knit four revolutions, at which time the operative should narrow down 4 times, 1 needle at every 4 courses. Then knit 40 revolutions, then narrow down one 7 times at every 5 courses, then knit 7 courses, and the sleeve is completed.

Next comes the cuff, which takes 20 needles in each bar with the locks and cams set to make the ribbed stitch with an attachment called a rack which moves the front needle bed or plate over one needle, giving a finished edge. After this racking operation the machine is run 13 revolutions, when the cuff is ready to be knitted to the sleeve. The pockets are also knitted in tubular form with 18 needles in each bar, taking 36 revolutions of the machine. Then comes the turning, which takes 10 needles in each bar. This is also knitted in tubular form, and takes about 2 yards for a jacket. This completes the machine knitting. Then the garment is taken to the finishers, who knit it together with a hand needle, using the same kind of yarn. After finishing the garment looks as if it was all machine made. This completes the garment with the exception of the but-

tons, which are sewed on by machine. The button-holes are also made by machine. This garment retails at from $4 to $7 apiece. Pockets generally cost about 50 cents extra. They are made in various weights which are governed by the number of ends used as well as the stitch cams. There are other styles of sweater coats on the market today but none are more popular than the shaker sweater coat. The auto or touring coat with the V or turtle neck is also very popular.

THE BEATTIE NONPAREIL LOOPER

In a previous issue we made a brief mention of the "Nonpareil" looper built by the Beattie Manufacturing Co., Cohoes, N. Y. We are now able to illustrate this machine, shown at Fig. 1, and also the work which it does, Fig. 2. This looper which gives a two-thread stitch has been thoroughly tested with the most satisfactory results in a number of leading knitting mills, and the builders now feel warranted in claiming that they are offering a machine which is unexcelled for this class of work. It makes a two-thread stitch which is in so much demand at present, affording an elasticity equal to that of the fabric itself. The curved needle used in the single stitch machine is retained, but all cams and springs have been dispensed with, the looper being worked entirely by eccentrics which insures smooth running and permits of high speed.



A SAMPLE OF WORK DONE ON THE NONPAREIL LOOPER.

FIG. 1. THE BEATTIE NONPAREIL LOOPER.

The Beattie patented raised points will be found on the new machine, also many other valuable features. The Beattie Manufacturing Co. is supplying the new looper and are also applying the improvements to old loopers if desired.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

A KNITTER'S PROGRAM

NATROMA

It was in the middle of July, six years ago, that our foreman received an offer of a better position and accepted it. Our knitting department at the time was behind in the filling of orders. We had a full set of knitters but were short of toppers. I was called to the office and told I could have the overseer's job. I was frankly told by the superintendent that I would probably get along all right if I did not get the help all out. Well, to tell the truth, for a fellow that lacked a whole lot of having an angelic disposition, it was a wonder how I got through the next three months. Probably because my department was not larger, and as I had been doing all the machine fixing in the department for five years, all the machines were in good order.

As I look back today the thing that bothered me most was that there had been very little system about booking orders, consequently it took considerable time to find out what should be knit next. The orders as they came from the commission house were booked at the office. They were then copied, a statement of the order numbers, styles, assortments and deliveries being sent to my department daily. I was supposed to fill the orders as rapidly as possible, according to the dates of delivery. That sounds easy, but we were two months late with our regular orders and the commission house was sending new orders, asking for promise of delivery on these as well as on some of the regular orders and calling for samples at the same time.

We were making about fifty styles that year and could not knit more than ten or twelve styles profitably at one time. I was compelled to go back to the office and get them to tell me what to mark 1, 2, 3, 4, etc., and these numbers needed to be revised about every time the mail came in. I determined to straighten those orders out so that I should know what I was doing in another rush season. This is the way the problem was solved. Each month, early, I went through my orders for the following month, arranging the regular orders by the dates of delivery, something like the following:

NOV. HOSE.

11/1 (o/20 Style Doz.)	11/15	11/25
9201 - 25 - 64	9202 - 23 - 32	9204 - 43 - 64
9247 - 67 - 32	9340 - 67 - 72	9227 - 25 - 32
9251 - 43 - 64		9251 - 43 - 64
9246 - 98 - 96		

When I ordered a case I checked the item before the order number, and when it was reported knit I checked after the number of dozen. See order No. 9,247 of 11/1 delivery, also No. 9,340 of 11/15 delivery. These monthy sheets I fastened together with a wire clip, the half hose, hose and misses' hose being filed under separate clips. The rush orders and "at once" deliveries were posted in a passbook as fast as they came in. Any orders on which we had to promise deliveries were transferred to this book on the day of the promise. The special orders were booked in the following manner:

Dated	o/No.	Style-Doz.	Pr.	K.
11/1	9247 R	67 - 32	11/6	11/5
	9251 O	43 - 64	11/17	
11/3	9342 R EX.	23 - 32		11\4

R. = Rush Ex. = Express Pr. = Promised K. = Knit
O. = At Once

Samples were always given the right of way. I had the tickets made out for the samples as fast as the orders were sent up, and filled them at once. Next in order were the specials, and when I had gone as far as I could with these we worked from the regular program sheets.

With this arrangement of orders it is easy to see what should be made next whenever it becomes necessary to change and make a different style. With a little study of these programs one can easily plan to have the yarn ready so that the changes can be made with little time lost.

A STOCKING WELT FORMER

An improved welt former has recently been patented in this country and is described by the inventor as follows:

Fig. 1 is a front elevation of a machine equipped with the device. Fig. 2 is a vertical sectional side elevation; Figs. 3 and 4 are sectional diagrams showing the manner of using the welting mechanism.

The machine involves two tubes adapted to telescope, and these are utilized to form the welt or fold on the stocking. The two tubes are relatively movable either together or separately. What may be considered the base or stocking supporting tube is stationary or practically so in the machine shown in the illustrations, the upper member being given the necessary movement. This base

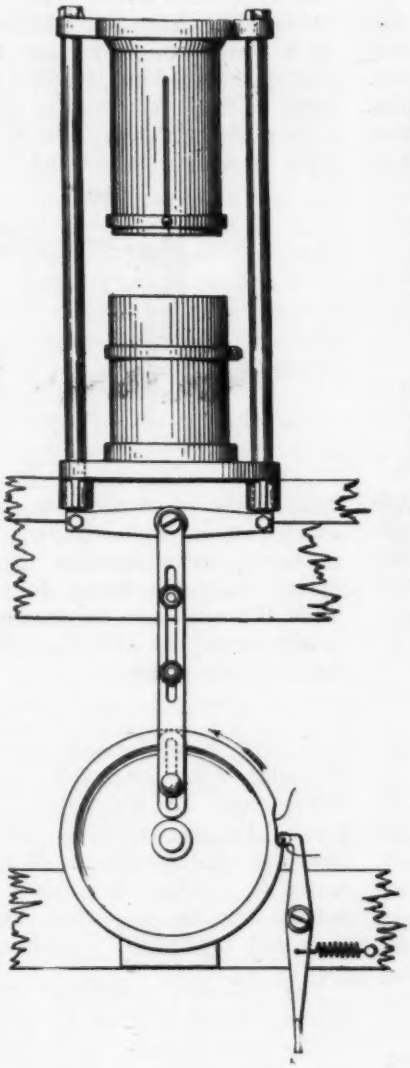


FIG. 1.

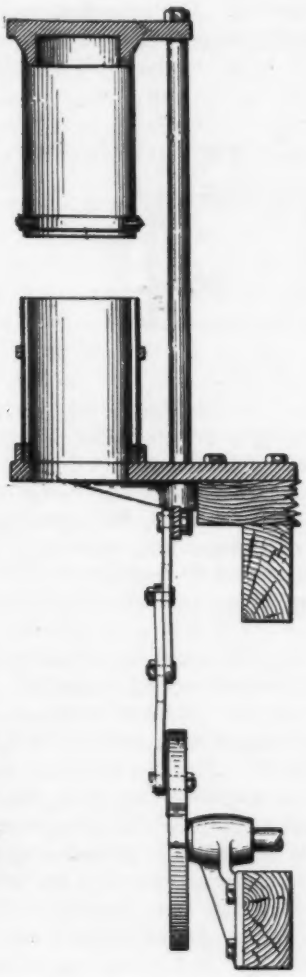


FIG. 2.

tube is made of spaced sections, the other tube being projectable into the space between the sections of the sectional tube to form a double fold on the stocking.

One of the tubes consists of outer and inner sections, spaced a suitable distance from each other by a ring, the three parts being rigidly united. The tube first may be, if desired, rigidly supported by a plate connected by bolts or otherwise with a table or

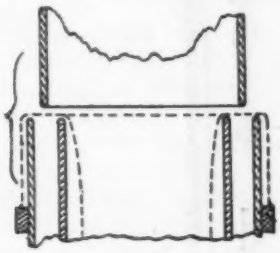


FIG. 3.

bench, the plate or analogous tube carrier having an opening in register with the opening of the inner tubular section. The stocking extends through this opening, while suspended from or by the tube, the upper marginal portion of the stocking overlying the top of the tube and extending across or bridging the space or interval between the two sections.

The tube is provided with a suitable gage by which the operator of the machine can determine the amount of welt to be made. This gage may consist of a divided or split ring surrounding the tube and vertically slidable thereon, the gage or ring being maintained in an adjusted position by a screw. The stocking to be welted is passed with its upper end up from the lower end of the tube, being inserted through the opening. The upper stocking end is carried upward and is folded over the upper end of the top of the tube and then brought down outside until the upper edge of the stocking is in contact with the gage which has been previously adjusted. The stocking when in this position is in readiness for welting.

The upper or movable tube is fitted around the pendant annular portion or flange of a head rigidly connected with the vertically reciprocatory parallel rods which have a sliding motion through perforations in a plate, and which are connected at their lower extremities by a cross piece. The tube is projectable into the space between the sections, and as it moves into said space, the upper portion of the stocking is folded or doubled on itself to produce the welt. The upper tube is so related as to form the welt in one complete stroke, provision being made for adjust-

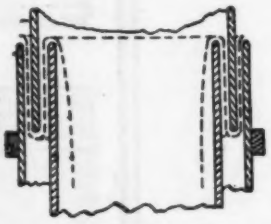


FIG. 4.

ment of the upper tube to adapt it to welts which vary in depth. When the machine is set to any one adjustment, the welts formed during such adjustment do not vary, and while the welts can be precisely and accurately formed, no skilled operator is necessary in this connection.

In 1910 New Zealand exported wool to the value of $40,378,873, as against $30,646,616 in 1909. The last returns (1910) showed a total of 24,269,620 sheep. During the year 1909 the total production of wool was estimated at 192,822,002 pounds, of which 5,202,821 pounds were purchased for local mills and 187,619,181 pounds exported.

The principal article of the $1,025,819 exports declared from Bradford, England, to the United States in October was wool, $315,558 worth, of which $116,757 was British. The shipment of silk noils and waste was $89,796, against only $10,448 in October, 1910. This large increase was due to the proposed change in the American customs classification of silk noils from the free list to a specific rate of duty which would be prohibitive.

Dyeing, Bleaching, Finishing, Etc.

STEAM SUPPLY TO DYE HOUSES

BY BETA-NAPHTHOL

The supply of steam to dye kettles is a matter of considerable interest, on account of the different conditions existing in various mills and the results obtained. It is a fact that the steam supply of many dye houses is quite insufficient for the volume of work handled, which prevents the dyer from turning out the quantity of work that he should. There are many mills, the steam plants of which are quite sufficient to supply the needs in summer time, but which in winter are inadequate.

Some mill engineers fail to grasp the idea that the most important asset of a dye house, besides an ample supply of good water, is live steam and plenty of it. It is not sufficient to have a supply of steam that merely suffices to warm the water in the dye kettles. It must be sufficient to bring the kettles above 200° F. within a short time.

To cause the water in the dye kettle to actually boil is for practical purposes unnecessary, although nearly all dyeing formula call for the work to be done at the boil, it is seldom that a temperature of a dye bath actually exceeds 205° F. In the laboratory, however, actual boiling at 212° is always the rule, and this accounts in a measure for the frequent results of laboratory tests showing fuller shades with the same percentage of dyestuffs than are obtained in practice.

The question frequently arises regarding the inequality of shades obtained in dye houses from the use of steam supplied to dye kettles at high and low pressures respectively. According to the construction of a dye kettle and the way in which steam is supplied to it, conditions may exist where uneven shades will be frequent. This condition came under the practical observation of the writer a short time ago, where steam was supplied to a woolen piece kettle in such a way that the bubbles of steam were blown directly towards one end of the tub, causing the pieces nearest that end to receive the full force of the jet. Evenly dyed pieces were only obtained when a perforated distributor was installed.

Whether steam is supplied at 80 pounds or 40 pounds' pressure appears to be of little consequence. Steam at 40 pounds per square inch at the kettles has a temperature of 267° F. while that at 80 pounds has a temperature of 311° F., a difference of 44°, the influence of which is rapidly lost in raising the temperature of the dye bath; 80-pound steam will of course raise the temperature of a given weight of water quicker than steam at a lower pressure.

The influence of dilution of the dye bath on account of the condensation of steam supplied to the kettle must not be lost sight of, as this in turn requires a certain amount of heat to raise it to the boil. A practical example will make this clear. To dye eight pieces of cloth weighing 400 pounds, there is required on an average 1,200 gallons of water, equal to 10,000 pounds. Assuming that this is supplied at a temperature of 60° F., and for argument sake, we wish to raise its temperature to 212° F., we must supply an amount of heat sufficient to add 152° F. As one pound of water requires one heat unit to raise it one degree, we must supply 1,520,000 heat units to effect that result. As a pound of steam at 80 pounds' pressure has 1,177 heat units, we will require 1,290 pounds of steam at that pressure which corresponds to 43 horse power per hour. Allowing 30 pounds per hour as being equal to 1 horse power, the heating should be effected in one hour.

With a lower horse power rating the same result may be obtained in a correspondingly longer period, provided that radiation and condensation are reduced to a minimum. Steam supplied at 40 pounds' pressure has 1,163 heat units per pound, from which we deduce that 1,307 pounds of steam will be required working under strictly normal con-

ditions. The condensation from the steam alone will increase the volume of our dye bath 150 gallons, to which must be added an increase of 48 gallons due to expansion of the original volume of water alone. If we take a unit-volume of water at 60° F., and heat it to 200° F., it will increase in volume 3 7/10 per cent., while at the boiling point it will increase 4 per cent.

A correspondent states that he has to contend with a great deal of water coming over with the steam from the boilers. This is unfortunate. Such a condition results from partial condensation along the steam line, or to priming. There may be at times too much water in the boiler or from the fact that steam is drawn off quickly at some point, or that the steam dome on the boiler is not large enough; this latter is not often met with in large modern boilers. Where water in the steam line is frequent it may be possible to remedy it by proper insulation and by placing baffle plates in the boiler.

In dyeing light worsteds, it is essential that the steam supply should be uniform so as to maintain a high working temperature and further to use dyes that are taken up very slowly from the dye bath. The dye kettle should be constructed in such a way that there is full and unrestricted circulation of the dye liquors and further, the influx of steam should be so distributed as to heat the bath uniformly.

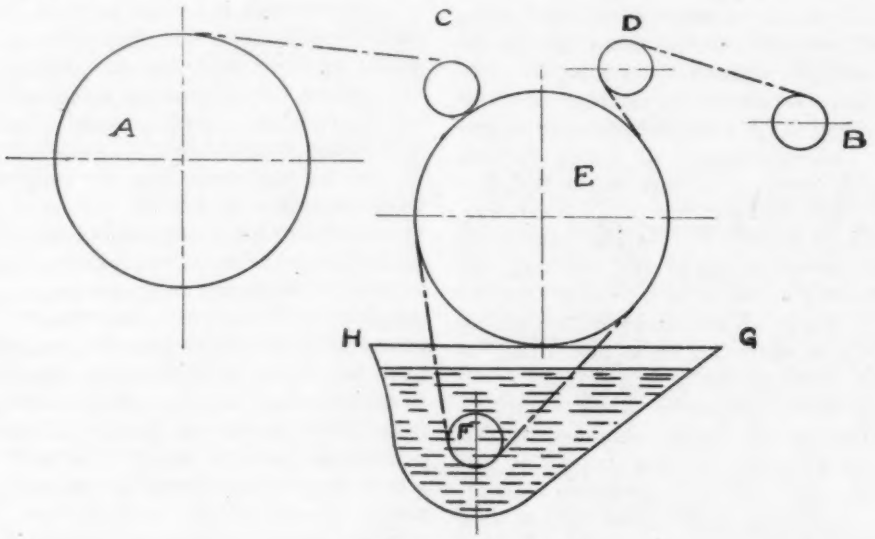
Of course, it is needless to comment upon the great advantage of using closed heating coils for dye baths, and supplying them with ample sized steam traps to carry off quickly the condense water, but this method of heating has yet to be generally adopted for large sized dye tubs. Kettles so heated will never cause steam spots on the pieces such as occur when steam from open jets impinges directly.

A NEW REVERSIBLE PADDER

BY JOHN D. STREET

At the recent Textile Machinery Exposition held at Roubaix, France, this very useful padder, the invention of a French firm of machinery builders, was shown.

The accompanying sketch shows a machine of marked simplicity but of great importance to the finisher when handling any fabric which requires more than one passage through the liquor, be it for dyeing, topping or stripping, and when by reason of economy the ordinary jig should not be used.



A NEW REVERSIBLE PADDER.

The novel feature consists of a large compressor roll, E, around which the cloth is made to pass. As the fabric is saturated in padder box, G, it is in contact with the compressor roll until squeezed by roll, C, which not only forces the liquor through the fabric, but acts as a nip or carrier roll, causing uniformity of travel, regardless of the size of the batched roll.

Rolls, A and B, represent the usual rolls as on a jig. These are mounted on a revolving shaft on which the cloth is batched or wound. For a second passage, the roll, C, is raised by a cam and roll, D, comes in contact with the compressor roll, E, and the passage of the fabric is reversed through the liquor. Roll, F, is the usual guide roll in the pad box. For a longer passage in the liquor, the size of the box could be increased and as many rolls as necessary introduced. Pad box, H, is made to swivel for emptying or cleaning purposes. The padder has the ordinary gears and brake to regulate the tension. Without doubt the compressor roll is of importance when treating closely woven fabrics. It will also prove a great help in handling any fabric which has a tendency to scrimp.

DIFFICULTY WITH SHADED GOODS

Editor Textile World Record:

We are having trouble with shaded goods and would like to have you give us information for overcoming the trouble. The goods are first secured in a light soap, then thoroughly rinsed, then put through a continuous wet finishing machine with a medium pressure on the rolls, the water in the three first tanks boiling slightly; and in the last, cold. They are then taken to the dyehouse and entered in the dye bath at a temperature of 100 degrees to 110 degrees F., brought to a boil in one hour, and boiled to the required shade. The dyestuff is previously dissolved in a small quantity of water in bottom of dye vessel. On our blues like sample we use Indocyaine 2 R F and M. After the goods are colored to the right shade they are rinsed lightly in the dye vessel, taken out and given a very light soap scour. They are then run in the extractor and dryed on a tentering machine. They are then sheared, steam brushed and pressed. We use a rotary press at 50 lbs. steam pressure. After pressing they are put on a roll hot and let stand not less than 12 hours.

Weymouth (1934).

From the information given regarding scouring, I should judge that the goods receive only a light soaping and that is a reasonable cause for the trouble. These goods could not be properly scoured with one soaping if they are taken in the grey. If the yarn has been heavily sized it would make a great difference in the scouring. Before replying definitely it would be necessary to know what kind of soap is used and how much to the gallon of water, also the amount of alkali used. The other processes seem to be all right, and the method of dyeing could not be improved. It might be well to enter the goods in the dye bath a little cooler if possible, say about 80° or 90°. Of course an acid shade is being used and 110° may be all right, but I should prefer a lower temperature if possible. Delaware.

THE DYEING OF HAND TWISTED SILK

BY DR. LOUIS J. MATOS

Acid colors are the most important for this class of work, and should be added in two or more portions to the dye bath, especially for heavy shades. The use of boiled-off liquor is desirable and should always be employed, and made slightly acid with oil of vitriol. The material to be dyed should be entered at 100° F., gradually raising to the boiling point, during which interval the total amount of dyestuff for the desired shade is added, after which allow to cool off, then rinse and brighten with tartaric acid. The amount of oil of vitriol to be added to the dye bath should only be sufficient to cut the boiled-off liquor used.

Penetration of the silk twist by the color is dependent upon three points: First, tightness of the twist, which if very hard will retard or effectually prevent complete penetration. Second, incomplete removal of the sericin from the silk, and is due to imperfect boiling-off. Third, use of dyes that are slow to penetrate the yarn. It is a fact that there is a choice of colors for penetration, those colors that are slow to dye being best for the purpose than those that are taken up quickly by the silk. As a general rule, for hard twisted silk thread, perfect boiling-off should be assured, and plenty of time given for dyeing.

"TARTARLINE," A NEW PRODUCT FOR USE IN CHROME MORDANTING

BY CREMO

The cream of tartar and bichromate of potash (chrome) method of mordanting wool has engaged the attention of textile chemists in recent years, the main object of their research being the cheapening of the process. The principle of chrome mordanting is to fix on the material to be dyed a metallic hydrate or basic salt which is capable of forming an insoluble color lake with certain organic dyes. These metallic compounds are deposited on the wool fiber in the most even and finest division in a form which prevents their removal from the fiber by washing. The use of the cream of tartar is the best known means of forming this chemical compound with the chrome (bichromate of potash), this latter mentioned chemical being thereby reduced from a chromic acid to a chromic oxide, creating a perfect affinity with the wool so that it will give satisfactory shades and fast effects in the subsequent dyeing with alizarine colors or the natural wood dyestuffs such as logwood extract, fustic extract, etc. The cost of the cream of tartar, however, is high, and its elimination and the substitution of a less costly though equally effective chemical or combination has been sought by chemists. As a consequence, numerous products of more or less merit have been brought into the market. A compound known as "Tartarline" has been in use in Europe for several years by large and most conservative dyehouses, and the elimination from these establishments of the use of the costly cream of tartar and other substitutes, is offered as evidence of the reliability and the practicability of Tartarline to do the work.

"Tartarline" is claimed by the manufacturers to be a pound for pound substitute for pure cream of tartar in the work of chrome mordanting wool, and it is produced at a cost very considerably lower than the cream of tartar, or even than most of its substitutes. They state that Tartarline produces an even and perfectly sure reduction of every particle of the chromic acid to chromic oxide, thus rendering all the chrome available for the mordanting purposes and preventing its waste. Because of this perfect reduction of the chrome, evenness of the finished dyeings is assured, also the perfect penetration of the dyestuffs through even the very heaviest and most closely woven piece goods, which can hardly be dyed through and through when cream of tartar is used.

The points made by the manufacturers in favor of the Tartarline are, first,—the positive saving that can be effected in the amounts of dyestuffs used, as equal depth and bloom of shade can be secured with less of the coloring matter, the fiber coming through with the much desired soft fine feel and finish;—and second, the claim for equal fastness to light and exposure.

The European manufacturers of Tartarline have recently placed the control of the product in this country in the hands of the Worden Chemical Works of New York City.

CHLORINATION OF WOOLEN GOODS

BY E. LODGE

Before the Huddersfield Technical College

(Continued from December.)

When a dilute solution of bleaching powder, or other hypochlorite is acted upon with dilute sulphuric or hydrochloric acids, either of two reactions occur, or both may take place. Free chlorine may be liberated or free hypochlorous acid may result. The following chemical equations expresses the course of the reaction:

$$\underset{\text{Hypochlorite}}{MOCl} + \underset{\text{Acid}}{HCl} = \underset{\text{Hypochlorous Acid}}{HOCl} + MCl$$

$$\underset{\text{Hypochlorite}}{MOCl} + 2HCl = \underset{\text{Free Chlorine}}{Cl_2} + H_2O + MCl$$

It is immaterial which of these reactions occur, as both free chlorine and hypochlorous acid behave towards animal fibers in the same manner. Since Mercer's discovery was made public a good deal of research work has been carried out by various people, more especially during the last fifteen years. The investigations have taken the form of inquiry as to (1) the best conditions necessary for obtaining the most desirable results, (2) to ascertain if possible, the na-

ture of the chemical and physical changes occurring in the fiber, (3) search for bodies capable of producing like results, without the defects of the chlorination processes, and (4) the possibilities of utilizing the process in various branches of the textile industry. Perhaps the most important of the observations made since Mercer's time is due to the Badische Aniline Company, who have pointed out that wool treated with an alkaline solution of a hypochlorite becomes partially resistant to certain dyestuffs.

The volume of liquid should be from 300 to 400 gals. (3,000 to 4,000 lbs.) per 100 lbs. of yarn and the solution should register 0.5° to 0.9° Tw. Lift out of this bath, lightly wring, and reenter hydrochloric acid bath, and turn for 15 to 20 minutes. If the yarn be stained yellow, pass for 15 to 20 minutes at a temperature of about 140° F. into a bath containing 10 to 20 per cent. bisulphite of soda. A soft handle may be imparted to the goods by an after treatment in a soap and oil bath. Florin and Lagache point out that a soft handle can be obtained by an after treatment with solutions of aluminate, zincate, stannite and stannates of the alkaline metals. Also that oxalates and acetates of certain metals produce similar results. Example 125 parts acetate of alumina, 10° B. (15° Tw.), 2,500 parts water, per 100 lbs. wool, work for half an hour in this solution. Lift, wash and expose to the air, when the softness returns.

To produce unshrinkable woolens, pass the goods through a solution of bleaching powder equal to about 5 per cent. on the weight of the material or an equal quantity of sulphuric or hydrochloric acids, or perhaps better, use 6 to 8 per cent. hypochlorite of soda made distinctly acid with sulphuric acid. Work freely in this bath for half an hour. The material will be slightly yellowed. This can be removed by treatment with about 10 per cent. bisulphite of soda. It is advantageous to add the hypochlorite in two or three lots. One of the reasons for laying this paper before your Society was to draw your attention to the possibility of using the process to obtain effects suitable for woolen and worsted goods. As already stated, wool chlorinated in acid solution has a greatly increased affinity for coloring matter. If, therefore, chlorinated yarns be woven with untreated yarns and piece dyed, the chlorinated yarn will come out deep in shade as compared with the unchlorinated wool, thus producing a fancy in dark and light color. In the same way, loose wool may be chlorinated, scribbled with untreated wool, and dyed, when mixture results similar in appearance to a dyed kempy wools. If wool is chlorinated in alkaline solution, woven with ordinary wool and piece dyed, the chlorinated wool will come out light in color, producing a pattern, light threads on a dark ground.

By weaving yarns chlorinated in acid solution and yarns chlorinated in alkaline solution together with untreated yarns three fold styles are obtained. By introducing cotton, silk or tannin resisted dyed yarns, four or even five color effects are possible. It may be asked why not dye the yarns first and produce the design direct? One answer to this question is that it would be necessary to stock a number of different colored yarns, whereas, under chlorination, pieces can be woven in any design and dyed to any required color.

The effects produced by chlorination may be extended in other directions. For example, wool piece goods printed in design with an acid, afterward passed into a solution of a hypochlorite, the material is thus chlorinated at the point touched by the acid, which on dyeing yields a light and dark pattern.

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In the manufacture of cottons, Germany ranks third, its production being excelled only by the United Kingdom and the United States, and next to Great Britain, it is the greatest exporter of cotton goods in the world.

During 1910 Japan imported cotton from the United States valued at $8,562,178. The imports of cotton into Japan from the United States during 1910 amounted to 59,293,733 pounds valued at $8,562,178, as compared with 95,338,800 pounds valued at $11,612,588 during 1909.

THE PREPARATION OF ABSORBENT COTTON

BY JULES GARCON

Bulletin de la Societe d'encouragement pour l'industrie nationale

Very little has been published on the subject of absorbent cotton. It is well known that this process consists in treating the cotton with hot alkaline solutions in order to rid the fiber of the fatty material and thus make it absorbent. About 1837 cotton wadding was proposed as a substitute for linen cloth for surgical bandages and in 1864 a French army surgeon, Auguste Touraine, connected with an expedition in Mexico, announced for the first time a formula for absorbent cotton, and the actual production dates very close to the antiseptic theories of Lister. About 1879 absorbent cotton became an article of commerce. Its consumption increased very rapidly and in 1887 the process was improved so as to produce very white and absorbent material. Prepared with care, it absorbs about twenty times its weight of water.

The choice of the cotton has a very important influence on the quality of the finished product. Other factors besides the set of the goods must be considered. Sea Island and Egyptian grades with their very fine and long fibers are not suited for the preparation of absorbent cotton because it is very difficult to make them absorbent. Brazilian cotton is too woolly and it is very difficult to bleach the colored grades. Indian cotton is very little used because of the short, tender and dirty fiber. The best grades are those known as New Orleans, Texas, Allen Seed, Mobile and Benders of middling grades. The cotton should be as clean and white as possible. Unripe fibers and those to which the seed is attached must be removed carefully because they do not possess the cellular canal and consequently cannot be made absorbent. They become brittle when treated chemically. Cotton card waste is used with success for absorbent cotton, but it does not give a product of the first quality. Cotton can be bleached without being made absorbent and, inversely, it can be made absorbent without being bleached.

On the continent of Europe absorbent cotton is obtained by removing all traces of fatty material by using a dissolvent like petroleum ether, bisulphide of carbon, or a simple treatment in alkaline solution without going so far as to bleach the fiber.

The principal operations for preparing absorbent cotton are:

1. Mechanical operationss. Sampling, assorting, cleaning, picking, carding. As it comes from the card it is run in the form of a web, providing absorbent wadding is required; for absorbent gauze it is run from the card in the form of a ribbon.

2. Chemical operations. The cotton, cleaned as well as possible by previous processes, is placed in a boiling kier, where it is washed and then treated with an alkaline solution to saponify all that is not cellulose, such as wax, fatty matters and pectose. The solution is then drawn off and the cotton is bleached to remove all coloring matter and bi-products of the alkaline treatment. It is then dried, immersed in acid and then dried again. It is next submitted to a second treatment with alkaline solution, after which it is again dred. It is then treated with acid, neutralized and dried. In all, twelve processes.

3. Mechanical operations. Cleaning, drying at 105°, carding, winding on spools and sterilizing.

Absorbent gauze is treated as follows:

1. The cotton is combed, drawn, spun, woven.

2. Chemical operations. They are the same as for wadding.

3. Mechanical operations require a tentering machine and a mechanical folder. The twelve phases of the chemical operations with the final sterilizing are of the most interest. The chemical treatment is very harsh and there is no bleacher who treats cotton with so much severity. Absorbent cotton is really but over-bleached cotton. In the course of the twelve operations it is necessary to take some precautions. The cotton should not be packed in kiers so tightly as to prevent the free circulation of the liquid.

The danger of overcrowding is especially great with short cotton which does not possess much elasticity.

The essential operation is the treatment with an alkaline solution. This consists in boiling the cotton with a 1 per cent. solution of caustic soda. The boiling is carried on at low pressure for from twelve to forty-eight hours. There is no advantage in treating it in a vacuum. The treatment with the alkaline solution destroys the cellulose. Kilmer found the loss to be from 4.41 to 5.71 per cent., after boiling one-half hour, and a loss of 5.08 and 7.33 per cent. after boiling for one hour in a 2 1/2 per cent. solution.

The alkaline process is followed by bleaching the cotton in a solution of hypochlorite containing 1 per cent. of chlorine. Hypochlorite of soda is more expensive than chloride of lime, but it gives a softer, whiter and more elastic cotton. Attempts have been made to use the Thompson process, but it was found to be too expensive and it is very difficult to work large masses of cotton. The price of peroxide of sodium is likewise too high to permit its use.

Bleaching of absorbent cotton is carried as far as the fiber will stand. It is necessary that everything that is not cellulose be removed and the cellulose itself is attacked and oxydized. This is the reason why absorbent cotton has an increased affinity for basic dyes. This affinity can often be used as a test of the absorbing power of the cotton. In fact, the absorbent fiber possesses the reactions of an oxy-cellulose.

The cotton is next washed and immersed in a 2 per cent. solution of sulphuric acid and a 1 per cent. solution of hydrochloric acid and the alkaline treatment is then repeated. These alkaline solutions are generally about 1/4 per cent., and boiling should not be prolonged. The cotton is rinsed and then treated with acid to eliminate all that can be dissolved, such as mineral salts, iron rust, etc.

The removal of all traces of the acids is one of the most important features of the process and is very difficult. It is nevertheless indispensable in order to avoid a tendering of the fiber during drying. The cotton is rinsed thoroughly in water to which is added either an antichlorine or soap. The antichlorine gives a cry to the cotton. Soap is preferable, but all traces of it must be removed, otherwise the cotton will become yellow. Some manufacturers leave soap in the finished product or add chloride of lime in order to increase the softness of the material and the hygroscopicity of the fiber, but such methods are always at the expense of the color. The operation is finished by a thorough rinsing and the character of the water is by no means an unimportant factor. Each fiber of absorbent cotton is porous cellulose, in other words, a filter. As there are more than 150,000,000 fibers in a pound, a batch of 1,000 pounds would form a filter of great capacity. If the water is impure the cotton will be injured.

The last operation consists of sterilizing, and it is very important. Most hospitals sterilize their own cotton, but large quantities of sterilized cotton are found on the market. For sterilizing wadding formaldehyde is used; for gauze, steam. The sterilizing is done under a 20-inch vacuum in a steel tank capable of holding 2,000 pounds of cotton. The process is carried on for two hours with formaldehyde or one hour with steam.

The medical profession employ a non-absorbent dressing which takes up the liquids by capillary attraction between the fibers, absorbent dressings, antiseptic dressings, or those that are sterilized. The antiseptics are few in number; phenol, salol, corrosive sublimate, iodoform, boracic acid, double cyanide of mercury and zinc are most frequently used.

Antiseptic gauze can be prepared dry by preparing the antiseptic in a volatile solvent, soaking the gauze in the solution and then evaporating the excess. The wet process consists in soaking the material in a non-volatile solution, or in an emulsion, for example, of glycerine.

Antiseptic cotton is at present but little employed, for the profession prefer to use the sterilized absorbent cotton. Absorbent cotton is also used outside the medical profession in purifying by filtration a large number of aqueous solutions such as oils, syrups,

milk, fatty materials, etc. Large quantities of absorbent cotton are used in the electrical industry and in the manufacture of incandescent mantles, varnish and various compositions of cellulose. For most of these uses a cotton giving the least quantity of ash after burning is to be preferred. The proportion of ash is very variable. According to the United States Department of agriculture the average ash of six samples of American cotton was 1.37 per cent.; maximum, 1.80 per cent.; minimum, 1.93 per cent. The proportion of ash from absorbent cotton depends more or less upon the severity of the treatment to which it has been subjected. The pharmacists of the United States, Great Britain and Germany state that absorbent cotton should not yield more than .8 per cent. of ash.

REMOVING SPOTS AND STAINS FROM TEXTILES

BY ROBERT DANTZER

An article on the removal of spots and stains from textile goods appeared in our October and November issues, giving detailed directions for treating different fabrics and spots made by different materials. The following table gives a summary of these recipes and for details reference is made to the article itself:

NATURE OF SPOT.	WHITE GOODS.	DYED COTTON.	DYED WOOL.	SILK.
Mucous liquid, sugar, gelatine	Washing in lukewarm water	Rinsing in luke warm water	Rinsing in luke warm water	Rinsing in luke warm water
Grease	Washing with soap and potash	Washing in luke warm soap solution	Soaping solution or ammonia	Benzine, ether, ammonia, chalk
Varnish, resin, wax	Turpentine, alcohol, eau de cologne and soaping	Turpentine, alcohol, eau de cologne and soaping	Turpentine, alcohol, eau de cologne and soaping	Benzine and ether
Tallow	Concentrated alcohol	Concentrated alcohol	Concentrated alcohol	Concentrated alcohol
Fruit, wine and red ink	Sulphur vapor and hot chlorine solution	Washing in luke warm soap solution or am'onia	Washing in soaping solution or ammonia	Ammonia
Alizarine ink	Tartaric acid	Dilute tartaric acid	Dilute tartaric acid	Dilute tartaric acid
Rust, ink made of nutgalls	Hot oxalic acid and dilute hydrochloric acid	Citric acid	Hydrochloric acid	Impossible
Albumen and blood	Rinsing in luke warm water	Rinsing in luke warm water	Luke warm water	Luke warm water
Lime and alkalies	Rinsing in clear water	Citric acid	Citric acid	Dilute citric acid
Acids, vinegar, etc.	Washing in hot chlorine solution	Dilute ammonia	Dilute ammonia	Dilute ammonia

COLOR CARDS

Read Holliday & Sons, Ltd., 11 Gold St., New York, have issued an attractive color card, bound, showing 148 samples of wool and cotton mixtures dyed with their Union colors. It is gotten up in a very neat manner with complete dyeing directions. They have also issued a folder showing 20 samples of wool goods dyed with their Fast Milling Colors.

Cassella Color Co., 182 Front St., New York.

A bound folder showing 266 samples of the fashionable shades for 1911-12, produced with easily leveling colors. Full directions for dyeing are also given.

Messrs. Geisenheimer & Co., 181 Front St., New York, have just issued a very attractive color card in which they show a number of their dyestuffs printed on silk. The first sample is an American flag and there are other smaller samples printed with red, green, blue, yellow and black.

Messrs. Geisenheimer & Co., 181 Front St., New York, have issued a color card showing nineteen samples of substantive colors dyed on silk and cotton discharged with hydrosulfite.

Discharge Effects on Cotton Fabrics. The Cassella Color Co., New York.

Fifteen patterns of various designs are shown illustrating the adaptability of their series of Diamine colors to be discharged with Hyraldite. This card is numbered No. 3316 and may be had on application.

BLEACHING TULLE

Editor Textile World Record:

Please give me some information regarding the bleaching of tulle. Bleacher (1966).

There are two methods of bleaching tulle. By the first one the pieces are immersed in a solution of chlorine at 3° to 4° Be. in cement tanks. This solution should be clear and not contain any particles in suspension. The goods are left in the liquor over night. The chlorine liquor is then either run off or pumped into a storage tank to be used again. The goods are rinsed in cold water, then soured in a solution of sulphuric of hydrochloric acid. They are next rinsed and then dried by being run through squeeze rolls and over drying cylinders.

By the second process the pieces of tulle are sewed together to form an endless apron and immersed in a boiling solution of caustic soda at 1° to 2° Be. The pieces are circulated in this liquor until thoroughly impregnated. The goods are left in the solution for 24 hours and then rinsed. They are next put in a kier and boiled for 6 to 10 hours at a pressure of 2 to 4 atmospheres in a solution of milk of lime to which is added resin soap and caustic soda. Next comes rinsing in water and then treatment in an open kier in a 1° to 2° solution of chlorine. The goods are left in this chlorine solution for about 12 hours. This is followed by rinsing in water as in the first process. The goods are then dried as in the first process or by the aid of a calender, the latter method being preferable. The bleaching is improved by bluing with ultramarine.

Recently some modifications have been made in the process. When the goods come from the kier the pieces are arranged in tanks and the solutions of chlorine and of acid are alternately pumped over the material. This method gives more uniform results. Usually the pieces are sewed end to end and guided by rollers and rings through the different stages of the operation. The material is soured in a solution containing 10 parts of acid in 1,000, and left over night. They are then rinsed in water at 120° F. The goods are then given a final and thorough washing in a soda solution, which is indispensible, in order to remove all traces of acid from the fiber. Gaul.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 1

BROWN ON COTTON YARN

Direct Brown G O on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Brown G O.
(Innis, Speiden & Co., 46 Cliff St., N. Y.)
20 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour.

Direct Brown G O is noted for its level dyeing properties and its fastness to light and alkalies.

Recipe No. 2

GARNET ON WORSTED YARN

Milling Red C on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Milling Red C.
(Read Holliday & Sons, 11 Gold St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter the material and raise the bath to a boil, dyeing at a gentle boil for half an hour. Steam is then shut off and 1 lb. sulphur acid, largely diluted with water, is added and dyeing continued for a further half hour at the gentle boil. If the wool is on shade it is then washed off. If not on shade the bath should be cooled down, the requisite additions made, and the boiling continued for another half hour.

Recipe No. 3

BLUE ON WORSTED YARN

Chrome Blue W D on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Blue W D.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
10 lbs. Acetic Acid.

Dye at a boil for 1/2 hour, then add

10 lbs. Acetic Acid

and continue the boiling for 1/2 hour longer. Then after-chrome in a fresh bath made up with

1 lb. Potassium Bichromate,
5 lbs. Acetic Acid,

boiling for 3/4 of an hour.

Chrome Blue W D is a very level dyeing color, suitable for piece dyeing. It is of good fastness to light, milling, stoving and decatising.

Recipe No. 4

RED ON WORSTED YARN

Guinea Red S D B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Guinea Red S D B.
(Berlin Aniline Works, 213 Water St., N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Guinea Red S D B possesses good fastness to light, acids, and alkalies.

Recipe No. 5

GREEN ON WORSTED PIECE GOODS

Alizarine Green S B W on 100 lbs. worsted piece goods with silk stripes. Prepare the dye bath with

3 lbs. Alizarine Green S B W.
(American Dyewood Co., 84 William St., N. Y.)
4 lbs. Ammonia 26° Tw.

Enter the goods lukewarm and bring quickly to a boil. Add 6 lbs. acetic acid and boil 40 minutes. Add 1-1 1/2 lbs. oil of vitriol and boil another half hour. Add half as much chrome as color and continue the boil a further half hour. Rinse.

Alizarine Green S B W is a level dyeing product distinguished by extra fastness to light and the ability to color worsted goods with silk stripes, leaving the silk white.

Recipe No. 6

BLACK ON WORSTED PIECE GOODS

Alizarine Black S J on 100 lbs. worsted piece goods with silk stripes. Prepare the dye bath with

6 lbs. Alizarine Black S J.
(American Dyewood Co., 84 William St., N. Y.)
4 lbs. Ammonia 26° Tw.

Enter the goods lukewarm and bring quickly to a boil. Add 6 lbs. of acetic acid and boil 40 minutes. Add 1-1 1/2 lbs. oil of vitriol and boil another half hour. Add half as much chrome as color and continue the boil a further half hour. Rinse.

Alizarine Black S J is a level dyeing product distinguished by extra fastness to light and the ability to color worsted goods with silk stripes, leaving the silk white.

Recipe No. 7

RED ON COTTON YARN

Diamine Fast Red 8 B L on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Fast Red 8 B L.
(Cassella Color Co., 182 Front St., N. Y.)
½ lb. Soda Ash.
25 lbs. Common Salt.

Dye at a boil for one hour.

Diamine Fast Red 8 B L gives an excellent shade possessing very good fastness for a direct cotton color.

Recipe No. 8

BROWN ON WORSTED YARN

Chrome Brown M 264 on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Chrome Brown M 264.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
10 lbs. Acetic Acid.

Enter at 120° F., raise to a boil and dye at a boil for 3/4 of an hour. Then add

5 lbs. Acetic Acid

and boil for 1/2 hour longer. Then enter into a fresh bath containing

1 lb. Potassium Bichromate,
5 lbs. Acetic Acid,

and after-treat at a boil for 1/2 hour.

Chrome Brown M 264 possesses very good fastness to stoving, carbonizing, milling and light. It may be applied by the chromate process. In piece dyeing it will leave silk white. It is a very level dyeing color.

Recipe No. 9

BLUE ON WORSTED YARN

Patent Blue V New on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Patent Blue V New.
(H. A. Metz & Co., 122 Hudson St., N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Patent Blue V New is notable on account of its great purity and solubility.

Recipe No. 10

GREY ON WORSTED YARN

Cyananthrol Grey G Patented on 100 lbs. worsted yarn. Prepare the dye bath with

½ lb. Cyananthrol Grey G Pat.
(Badische Company, 86 Federal St., Boston.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Cyananthrol Grey G Pat. penetrates well, is level dyeing, and possesses good fastness to light.

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Recipe No. 11

BLACK ON WORSTED PIECE GOODS CONTAINING WHITE SILK EFFECT THREAD

Naphthalizarine Black G Extra on 100 lbs. worsted piece goods containing white silk effect threads. Prepare the dye bath with

5 lbs. Naphthalizarine Black G Extra.
(C. Bischoff & Co., 451 Washington St., N. Y.)
8 lbs. Acetate of Ammonia.

Enter at 140° F., raise to a boil and dye at a boil for one hour, exhausting with

12 lbs. Acetic Acid,

and after-treating in a fresh bath made up with

2 lbs. Potassium Bichromate,
6 lbs. Acetic Acid,

and boiling for 1/2 hour.

Naphthalizarine Black G Extra will be found an excellent dyestuff for the dyeing of worsted and woolen piece goods containing white silk effect threads, as it leaves the silk entirely white.

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Recipe No. 12

BLUE ON COTTON YARN

Brilliant Fast Blue 4 G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Brilliant Fast Blue 4 G.
(Farbenfabriken Co., 117 Hudson St., N. Y.)
30 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour.

Brilliant Fast Blue 4 G possesses excellent fastness for a color of this type.

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Recipe No. 13

VIOLET ON COTTON AND WOOL UNION CLOTH

Naphtamine Union Violet C on 100 lbs. cotton and worsted union cloth. Prepare the dye bath with

5 lbs. Naphtamine Union Violet C.
(Kalle & Co., 530 Canal St., N. Y.)
20 lbs. Common Salt.

Enter the material at 80° F., and bring to a boil in 1/2 hour, boil for 1/4 hour, shut off the steam and run for 1/2 hour in the gradually cooling bath.

Naphtamine Union Violet C, especially in conjunction with Naphtamine Union Blue C, is valuable in the production of the Coronation shades of blue and purple which are so much in demand at the present time.

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Recipe No. 14

BLACK ON COTTON YARN

Chlor. Black Y on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Chlor. Black Y.
(Read Holliday & Sons, 11 Gold St., N. Y.)
1 lb. Glauber's Salt.
2 ozs. Soda Ash.

Enter in a lukewarm bath, raising to a boil in one-half hour, dyeing continued at a simmering heat for half an hour. Steam was then shut off and the pieces allowed to run for half an hour in the cooling bath in order to feed up the cotton.

Chlor. Black Y possesses excellent fastness to light and alkalies.

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Recipe No. 15

RED ON WORSTED YARN

Guinea Red S D G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Guinea Red S D G.
(Berlin Aniline Works, 213 Water St., N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Guinea Red S D G possesses good fastness to light, acids and alkalies.

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Recipe No. 16

BLUE ON WORSTED YARN

Tolyl Blue S T on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Tolyl Blue S T.
(H. A. Metz & Co., 122 Hudson St., N. Y.)
20 lbs. Glauber's Salt.
6 lbs. Acetic Acid.

Enter at 140° F., and dye at a boil for 3/4 of an hour. Then exhaust the bath by adding

2 lbs. Sulphuric Acid

and continuing the boiling 1/2 to 3/4 of an hour longer.

Tolyl Blue S T possesses very good fastness to light, and does not crock

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Tartarline. Worden Chemical Works, 4 Cedar St., New York City, are putting on the market a full and complete substitute for cream of tartar which produces excellent results and at a very considerable saving in cost.

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Warp Stop Motions. Cohn Gebruder, Reichenbach, Schlicia. An improved warp stop motion which has been tested in German mills with satisfactory results.

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Mercerizing Machine. Max Kohl, Chemnitz, Germany. A machine for mercerizing cotton yarn. One feature has special reference to regulating the tension on the yarn.

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Automatic Water Softening Apparatus. George W. Lord of Philadelphia is bringing out an automatic water softener or purifier. The water which enters through the inlet pipe passes over a water wheel which furnishes the power for the operation of the filter. The proper degree of chemicals are automatically supplied and water in the mixing tank is agitated with paddles so that the solution of chemicals is of consistent and uniform strength and the precipitation of the injurious solid matter is added. It is designed so as to require practically no attention, the process being automatic throughout, except the occasional drawing off of the impurities through the sludge valve. This softener was originally designed for cold water treatment of feed waters, especially those in use by railroads and in industrial plants where a large battery of boilers is required, or where a water highly concentrated with injurious solids is being used. It may, however, be used in any industrial plants where pure water is required.

Dyeing Machine. Erckens & Brix, Rheydt, Germany. L. H. A. Schwartz, 40 Central St., Boston, Mass., American agent. A dyeing machine for indigo blue, the goods being kept submerged during the process.

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Resist Process. Societa Anonima Benigno Crespi, Milan, Italy. A process for causing vegetable fibers to resist the dyeing process.

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Moistening Machine. Benno Schilde, Hersfeld, Germany. An apparatus for moistening wool and cotton yarn in order to increase the weight. The yarn is treated in a closed kier.

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Reclaiming Fiber from Waste Liquor. The Sucrofilter und Wasserreiningaungs-Gessellschaft, Berlin, Germany. A machine for automatically removing wool, cotton and other fibers from waste liquor. It is being successfully used by A: & A. Lehmann, Berlin, and has been tested with satisfactory results by the German Testing Bureau.

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Scouring Process. Stockhausen & Traiser, Krefeld, Germany. A process for cleansing textile materials with benzine, but without the danger of explosion, which is one of the objections to the ordinary benzine process.

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Paper Yarn. Emil Claviez, Adorf, Germany. A process of manufacturing yarn from a mixture of paper and textile fibers.

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Scouring Process. Gebrueder Schmid, Basel, Switzeriand. A machine and process of scouring yarn and fabric, being especially suited for silk goods.

THE "CORNELL" VACUUM EXTRACTOR

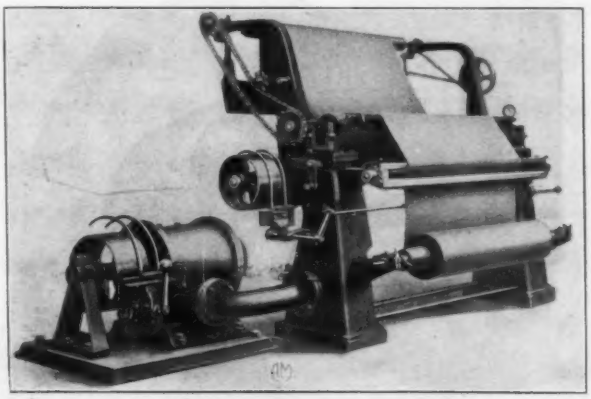
This is a machine for extracting water from piece goods on the well known vacuum principle. It is sold by A. H. Buhlmann, textile engineer, 487 Broadway, New York. The machine consists of a suction box having a slit lengthways at the top and over which the fabric passes. A vacuum is created by a pump and the air passing through the cloth carries the moisture from the goods.

The suction channels are easily accessible to facilitate a cleaning. In order to prevent any part or small fibers from entering into the pump, or obstructing the channels, a number of fine sieves are provided which can easily be removed and cleaned. The machine has a step-pulley arrangement for variable speed. The current working-width is 63 inches.

The advantages of the "Cornell" vacuum extractor are summarized as follows: Thorough and uniform extracting of the moisture throughout the piece, this being especially important in carbonizing cloths; no creases, wrinkles or injury to the nap and face of the fabric; a large production and economy of labor, one attendant being able to run several machines; suitable for both heavy and light goods; variable speed to regulate the amount of moisture left in the goods; no vibration and no special foundation required; economy of space.

The vacuum system for extracting moisture from wool goods was first introduced in Europe where it has long given much satisfaction, now being installed in the leading finishing works. This system is also in successful operation in the United States.

Further information can be obtained from Mr. Buhlmann.



THE "CORNELL" VACUUM EXTRACTOR.

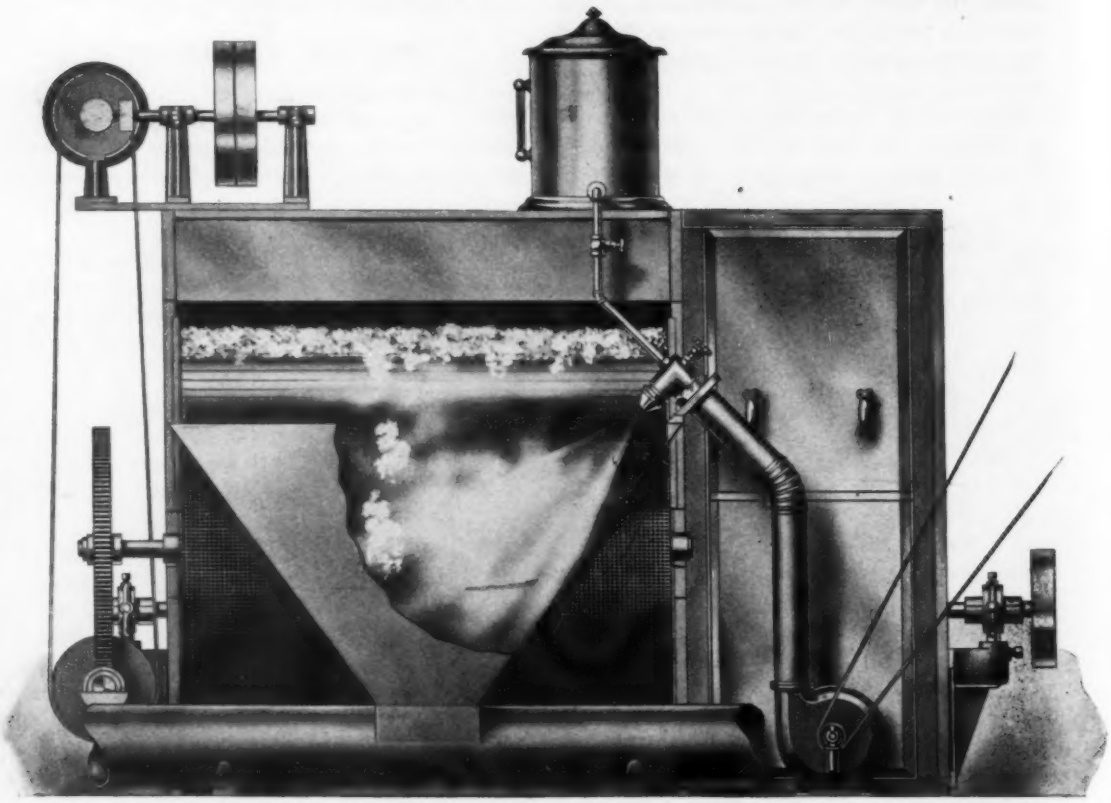
THE VAPO WOOL OILER

This wool oiler built by the C. G. Sargent's Sons Corp., Graniteville, Mass., is constructed on the well known turbo humidifier principles, being operated by a pressure blower to which it is attached. The oiler can be adjusted to throw the oil horizontally onto the stock or at any angle desired. The oil is deposited on the wool in the form of a fine vapor and thus oils the individual fibers which is not possible when the oil is dropped on the material. The Vapo wool oiler has been found of great advantage on the mixing picker, at the delivery end of the burr picker or dryer, also at the delivery end of wool washers where the wool is opened after being washed and it is desirable to oil it between the opening and the carding.

The illustration shows the oiler attached to the doffer end of the wool dryer. It is also recommended for gill boxes and similar machines where it is desirable to oil the wool.

The oil flows to the head by gravity, from

a tank located above the head. The flow of oil into the head is regulated by means of a needle valve, which is constructed for fine adjustment. The air from the blower passes tangentially through three slots in the wall of the inner or vaporizing chamber into the chamber itself, causing a vacuum which draws the oil through the oil jet, and breaking it up into fine particles throws it forward onto the wool in a fine vapor. Part of the air passes along the outer chamber, coming into the atmosphere diagonally in front of the vaporizing chamber, and further assists in breaking up the vapor, and eliminates all possibility of any oil whatever being deposited on the wool in drops. With this head is also supplied two oil jets, one of which is designed to throw a coarse open body of vapor, the other a fine concentrated body. In this way the head can be operated to throw a cloud of vapor that at eighteen inches from the head would cover an area four inches in diameter, or, at the same distance from the head the oil could be spread over an area of eighteen inches in diameter.



THE VAPO OILER ATTACHED TO THE DOFFER END OF A WOOL DRYER.

A No. 00 pressure blower running at 5,500 revolutions per minute will produce sufficient pressure, about eight to ten ounces, to operate the head to the best advantage. The head can be regulated to vaporize a minimum amount of oil from 0 to 2 gallons per ten hours, while the maximum amount of oil fully vaporized per ten hours should be 80 gallons. If, however, a ten or twelve-ounce air pressure is maintained on the head, it will vaporize as high as 150 gallons per ten

hours. This increased amount, however, would necessitate the use of a special oil nozzle and valve. If an air pressure of eight to ten ounces is to be maintained the bottom of the oil tank should not be located more than thirty-six inches above the head.

If it is desirable to operate the wool oiler with compressed air, it can be readily done by attaching a one-inch compressed air pipe to the head in place of the blower pipe, and reducing the air pressure with a regulator valve to eight pounds.

THE JACKSON BELT LACING MACHINE

The general adoption of the Jackson belting lacing machine by manufacturers of all kinds of products is the best possible evidence of the merits of this method of belt lacing. Textile manufacturers have been quick to recognize its advantages, and as a result the Jackson machine is found in many of the leading cotton, silk, knitting, woolen and worsted mills. In the extensive list of users we find the following well known textile concerns:

Cotton Mills and Cotton Goods: American Thread Co., Willimantic, Mass.; Massachusetts Cotton Mills, Lowell, Mass.; Eddystone Mfg. Co., Philadelphia, Pa.; Griswold Worsted Co., Darby, Pa.; Nashua Mfg. Co., Nashua, N. H.

Hat Manufacturers: American Hatters & Fur. Co., Ltd., Danbury, Conn.; Dutchess Hat Works, New York; Ulster Hat Co., Wallskill, N. Y.

Knitting Mills: N. L. Birge Sons Co., Bristol, Conn.; Taubell Knitting Mills, Norristown, Pa.; Gloversville Knitting Co., Gloversville, N. Y.; Oneita Knitting Mills, Utica, N. Y.; Roxford Knitting Co., Philadelphia, Pa.; Wright & Heath Underwear Co., Cohoes, N. Y.

Silk Goods Manufacturers: E. Richard Meining Co., Reading, Pa.; Enterprise Mfg. Co., Philadelphia, Pa.; F. J. Hartman, Danville, Pa.; Saquoit Silk Co., Catassauqua, Pa.

Woolen Mills: American Woolen Co., Providence, R. I.; Arlington Mills, Lawrence, Mass.; Auburn Woolen Co., Auburn, N. Y.; Byfield Woolen Co., Byfield, Mass.; Cleveland Woolen Mills, Cleveland, O.; Geo. H. Gilbert Mfg. Co., Ware, Mass.; Globe Woolen Co., Utica, N. Y.; Pontoosuc Woolen Mfg. Co., Pittsfield, Mass.; Singleton Worsted Co., Franklin, Mass.; Woonsocket Worsted Co., Woonsocket, R. I.; Textile Machine Shops; American Laundry Machine Mfg. Co., Rochester, N. Y.; American Machine Co., Ltd., Pawtucket, R. I.; Atherton Machine Co., Paterson, N. J.; American Tool & Machine Co., Boston, Mass.; Atwood Machine Co., Stonington, Conn.; Allis Chalmers Co., Scranton, Pa.; Brierly Lombard Co., Worcester, Mass.; Draper Co., Hopedale, Mass.; Defiance Machine Works, Defiance, O.; Mason Machine Works, Taunton, Mass.; Farrell Foundry & Machine Co., Ansonia, Conn.; Foster Machine Co., Westfield, Mass.; Acme Knitting Machine & Needle Co., Franklin, N. H.; Crompton & Knowles Loom Works, Worcester, Mass.; Johnson & Bassett, Worcester, Mass.; Lowell Machine Co., Lowell, Mass.; Potter & Johnson Machine Co., Pawtucket, R. I.; Providence Machine Co., Providence, R. I.

The use of raw hide for belt lacing, while an old and quite common method of lacing

FIG. 1. THE HAND MACHINE IN OPERATION.

belts, has so many disadvantages that every one connected with the plant, from the manager down to the master mechanic, is always looking for some new and better method. In the first place, the raw hide lace costs from 10 to 12 cents for the material used to lace a medium size belt and often is the cause of a time loss of one-quarter to three-quarters of an hour. Another bad feature about the use of lace leather is the fact that when running in a damp or steamy atmosphere it will frequently get slimy and pull out of the belt. Still another objection

to lace leather may be found in the thick and thin places which frequently occur in the hide and unless precautions are taken when stripping the lace up, will cause weak spots which will break much sooner than other sections of the lace. These troubles result in a formidable expense account, including the time loss of the men operating the machine and the production loss from the machine itself.

The Jackson belt lacing machine, manufactured by the Birdsboro Steel Foundry and Machine Co., Birdsboro, Pa., is designed to remedy these difficulties by using wire in place of lace leather. It is adapted to be operated either by hand or mechanical power. Fig. 1 shows the hand machine as seen in operation. Fig. 2 shows the two ends of a belt when laced.

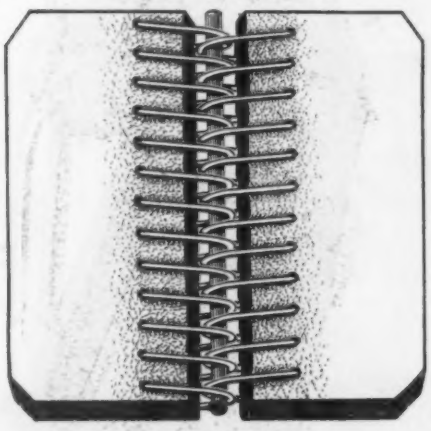


FIG 2. THE TWO ENDS OF A BELT WHEN LACED.

The manufacturers state that the machine makes the cost of material to lace a five-inch belt about one cent. One man can lace such a belt in about three minutes. When this small cost of operation and material is compared with the older method of using raw hide lacing it is at once evident that there is enough money involved to warrant the serious consideration of every plant manager and master mechanic in the country.

Occasionally one of the larger belts has to be laced during operating hours, which perhaps connects the main shaft with one or more counter shafts, thus causing several machines and workmen to be idle during the time the lacing operation is going on. This labor and production cost, when several machines are involved, runs into money very rapidly. In dye house work serious damage may result from stopping a dyeing machine to lace a belt.

Few superintendents and master mechanics know the exact cost of their belt repairs. In the large plants these repairs are so frequent that one or more men are usually employed in repairing belts, and beyond their time cost no record is made of the other losses except the use of the material involved. Another point is that the holes punched in the ends of the belt to accommodate the lace leather in time becomes rotted by reason of water or other liquid coming in contact with the belt, and as a result the belt breaks along the line of the holes several inches back from the end of the belt. This necessitates inserting a new piece of belting, making two laced joints in place of one. With the Jackson joint only a small amount of the belt is utilized, as shown at Fig. 1. The joint being practically a hinge, it passes over pulleys noiselessly and without slippage or friction, reducing vibration and wear upon the bearings. This machine will lace a belt 24 inches wide as easily and quickly as the smaller sizes and the lacing will be the same on both sides, flush with the surface in every instance. The joint is of uniform strength across the full width, so that the belt will run on flange pulleys without whipping the edges, even when used on belts which are crossed. Another unique feature is that the belt may be connected and disconnected at will. That these machines are approved by government engineers is evident from the fact that they are employed in the shops of nine large government plants.

The season's cotton crop of the Province of Adana, Turkey, is estimated at 85,000 to 90,000 bales. The 40,000 spindles and 595 looms of the four cotton mills of Adana and Tarsus will require over 35,000, leaving only about 50,000 for export.

A NEW DECORTICATING MACHINE

One of the problems in the commercial development of ramie has been a satisfactory decorticating machine to meet the conditions attending the growth of this fiber. Many different machines have been invented and used with more or less success. The latest to come to our attention is the fiber stripping machine made by G. Wm. Schlichten and owned by the International Fibre Co. of New York. We are informed that a number of these machines have been working for some time with success in California, not only on ramie but on hemp and other fibers of a similar nature. The purpose of the machine is to separate the fiber from the seeds and waste straw. Thousands of tons of flax straw are burned every year in the United States after the seed is extracted, even though several processes for chemically retting the flax have been developed. This machine is somewhat similar to the thresher and may be drawn from place to place upon its own wheels. It is fed by hand at one end and delivers the fiber from the other end of the machine. A blower conveys the waste and woody material to the engine, which uses it for its own fuel. Its capacity is said to be from one to two tons of clean fiber per day, depending on conditions.

THE SCHLICHTEN DECORTICATING MACHINE FOR SEPARATING THE FIBRE OF RAMIE AND SIMILAR PLANTS FROM THE STALK AND SEED.

Ramie has long been known to the textile public and many mill men have realized its possibilities when some of the practical difficulties were overcome. One of these have been to get an adequate and regular supply of the raw material at a reasonable price and this has been largely due to the lack of suitable and economical means of preparing it. The inventors of this machine believe they have solved the question.

The wool shipments from Argentine ports from October 1, 1910, to September 30, 1911, totalled 433,251 bales, of which 30,071 went to the United States.

WARP STOPS ON WOOLEN AND WORSTED LOOMS

Woolen and worsted manufacturers have been somewhat skeptical as to the advantage of warp stops for woolen and worsted looms. Their merits are so generally recognized in cotton mills that it is now only a choice of which warp stop to use.

Some figures have been recently published showing the results secured with the K-A electrical warp stops on looms weaving worsteds and woolens. In one worsted mill where these warp stops were installed the number of sewers were reduced 60 per cent. and there is now practically no sewing of "warp ends out."

The following table shows the record from sewers who worked on cloth woven with and on cloth woven without the K-A electrical warp stop:

Without K-A	20 Cuts Woven	With K-A
3 hr. 0 min.		No ends out
4 hr. 0 min.		15 min.
1 hr. 15 min.		10 min.
1 hr. 30 min.		25 min.
3 hr. 30 min.		No ends out
3 hr. 0 min.		No ends out
3 hr. 0 min.		No ends out
1 hr. 30 min.		No ends out
1 hr. 30 min.		10 min.
1 hr. 0 min.		No ends out
2 hr. 30 min.		No ends out
3 hr. 0 min.		No ends out
1 hr. 30 min.		25 min.
4 hr. 0 min.		No ends out
4 hr. 0 min.		No ends out
1 hr. 0 min.		5 min.
3 hr. 0 min.		30 min.
2 hr. 0 min.		10 min.
1 hr. 0 min.		No ends out
3 hr. 0 min.		No ends out

This table is taken from systematically kept cloth room records, the cloth being of substantially the same composition and style. The average time consumed in sewing "warp ends out" in 40 cuts, woven without the K-A was 2 1/2 hours per cut. The average time consumed in sewing "warp ends out" in 40 cuts woven with the K-A was 8 1/2 minutes per cut. The saving in time devoted to sewing in "warp ends out" was over 90 per cent.

The Mossberg Wrench Co., Central Falls, R. I., have data bearing on this subject which would be interesting to manufacturers who have not believed that such a device could make a profitable showing on worsted or woolen looms.

THE OSWEGO CLOTH CUTTING AND PINKING MACHINE

The illustration shows one of the many machines for cutting cloth and pinking samples both by hand and power that are built by the Oswego Machine Works, Oswego, N. Y., of which Niel Gray, Jr., is the proprietor. The Oswego cutting machines are made in about 35 different sizes and styles, ranging from a small hand machine up to the largest power machines. They are provided with extra long, all iron back tables and hand

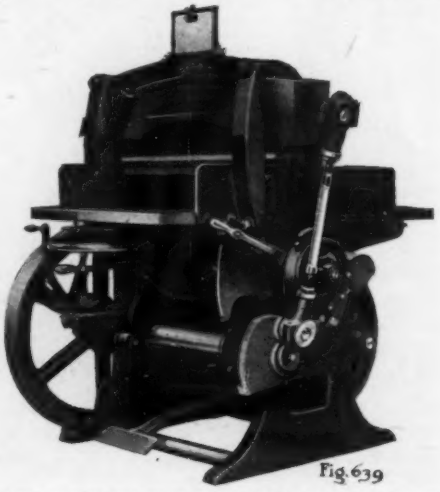


Fig. 639

THE OSWEGO CLOTH CUTTING AND PINKING MACHINE.

spacing devices for duplicating any desired widths, and also with power devices for automatically moving the cloth forward to the cutting knife. The machines are equipped with both the shear and vertical strokes, the change from the one to the other being easily and quickly made. This enables the cutting of other materials besides cloth at a minimum expense for the attachment. The Oswego pinking and cloth cutting machines are used in some of the largest cloth and clothing firms in the country and are giving general satisfaction. The builders have a high reputation for machines for cutting not only cloth but other materials. They will be pleased to give textile manufacturers full particulars regarding their line of products.

Personals

S. Y. McDonald has accepted a position as night overseer of weaving at the Brookfield Mills, Hickory, N. C., succeeding W. F. Mitchell. He comes from Lando, S. C.

John Elkin has accepted the position as master mechanic at the Chiquola Mfg. Co., Honea Path, S. C. He comes from Ware Shoals, S. C.

Clyde Cobb, overseer of carding, has been promoted to assistant superintendent at the Ware Shoals Mfg. Co., Ware Shoals, S. C.

R. F. Fisher has accepted the position as overseer of carding and spinning at the Stony Point Cotton Mill, Stony Point, N. C. He comes from McAdenville, N. C.

J. C. Edwards has accepted the position as overseer of carding and spinning at the Anchor Duck Mills, Rome, Ga.

W. C. Spencer, overseer of carding at the Rhode Island Mills, Spray, N. C., has resigned to accept a similar position at Rosemary, N. C.

J. C. Suttles has accepted the position as overseer of weaving at the Valley Falls Mill, Spartanburg, S. C. He comes from the Victor Mfg. Co., Greers, S. C.

M. V. Blankinship, overseer of carding and spinning at the Highland City Mills, Talladega, Ala., has resigned to accept a similar position with the Fort Valley Yarn Mills, Fort Valley, Ga.

C. H. Phillips, superintendent of the Hopedale Mills, Haw River, N. C., has resigned to accept a position as overseer of carding and spinning at the Oneida Mills, Burlington, N. C.

Hugh T. Wallace, overseer of weaving at the Ella Mills, Shelby, N. C., has resigned to accept a similar position with the Great Falls Mfg. Co., Rockingham, N. C.

Otto H. Muller has accepted the position as overseer of carding and combing at the Hudson Worsted Co., Hudson Mass. He comes from the Bigelow Carpet Co., Lowell, Mass.

Frank Stiner has severed his connection with the Great Falls Woolen Co., Somersworth, N. H., as overseer of finishing.

Earl J. Pray has accepted the position as overseer of spinning at the Old Colony Mfg. Corporation, Taunton, Mass. He comes from the U. S. Cotton Co., Central Falls, R. I.

H. M. Miles has accepted the position as overseer of carding and spinning at the Jennings Mill, Lumberton, N. C. He comes from Wadesboro, N. C.

A. P. Ritchie has accepted the position as overseer of spinning at the Cowpens Mfg. Co., Cowpens, S. C. He comes from Drayton, S. C.

S. L. Adler has accepted the position of overseer of carding at the Stonewall Cotton Mills, Stonewall, Miss.

Bud Kelly has accepted the position as overseer of carding and spinning at the Atlanta Woolen Mills, Atlanta, Ga.

B. F. Aiken has accepted the position as overseer of carding at the Anderson Mill, No. 1, Anderson, S. C.

J. R. Young has accepted the position of assistant superintendent at the Maple Mills, Dillon, S. C. He comes from Caroleen, N. C.

J. W. Hyde, from Fountain Inn, S. C., has accepted the position as overseer of carding at the Lavonia Cotton Mills, Lavonia, Ga.

J. M. Pearman has resigned as overseer of spinning and twisting at the Lavonia Cotton Mills to accept the position as overseer of carding and spinning at the Princeton Mfg. Co., Athens, Ga.

E. C. Herring has been promoted from second hand to overseer of carding at the Hannah Pickett Mill at Rockingham, N. C.

J. L. Hope, for the past four ears overseer of carding at the Hannah Pickett Mill, Rockingham, N. C., has been appointed superintendent of the Delburg Mill at Davidson, N. C.

Dawson Sutcliffe has accepted the position as night overseer of weaving at the Central Worsted Co., Central Village, Conn. He comes from Providence, R. I.

Timothy Moore, overseer of carding at the Josiah Perry Mill, Webster, Mass., has severed his connection to accept a similar position with the Union Mill, Herkimer, N. Y.

Royal P. White, superintendent of the Sterling Mill, Lowell, Mass., has been appointed agent to succeed the late A. F. Swanton.

Charles Godreau, overseer of spooling at the Hargreaves No. 1 Mill, Fall River, Mass., has resigned to accept a position as overseer of spinning and slashing at the Charlton Mill, same city.

Wm. H. Wye, Jr., who has been superintendent of the Wm. H. Wye Co., Needham, Mass., has accepted a position with Geo. E. Wye Co., same town.

William Stuart, overseer of finishing for Fairbanks & Dorr, Guild, N. H., has severed his connection with that company.

Louis J. Pendergast has accepted the position as overseer of carding at the Miller River Mfg. Co., Athol, Mass.

Jno. W. Bond has been appointed designer at the Hoosac Worsted Mills, North Adams, Mass. He comes from Harrisville, R. I.

J. H. Donovan has accepted the position as overseer of weaving at the Jefferson Mfg. Co., Jefferson, Mass. He succeeds Edward Fitzsimmons.

Louis Baker has accepted the position as second hand in the carding department at the Chicopee

Mfg. Co., Chicopee Falls, Mass. He comes from New Bedford.

John M. Smith has been appointed second hand in the weaving department at the West Boylston Mfg. Co., Easthampton, Mass.

Thomas Hogarth has accepted a position as overseer of night carding for John K. Stewart & Sons, Amsterdam, N. Y.

Fred Carter, overseer of weaving at the Premier Worsted Co., Bridgeton, R. I., has severed his connection with that company.

P. J. Mahoney, overseer of spooling, warping, dressing and drawing-in at the Wamsutta Mills, New Bedford, Mass., and who was in their employ continuously for fifteen years, has resigned his position and has accepted a position as overseer of the slashing and drawing-in at the Nashawena Mills, New Bedford.

Frank J. Renahan has accepted the position as overseer of mule spinning at the China Mill, Suncook, N. H. He was formerly second hand at the Crompton Mill, Arctic, R. I.

Alfred Gravel has been appointed overseer of spooling and warping at the Nashawena Mill, New Bedford, Mass.

Peter Eberhart has accepted the position as overseer of finishing at the Eagle Lake Mill, Jefferson, Mass. He comes from Worcester, Mass.

R. A. Cain, formerly overseer of weaving at the Montgomery Cotton Mill, Montgomery, Ala., has resigned to become overseer of weaving at the Pelham Mfg. Co., Pelham, Ga.

Peter J. Forand, second hand in the weaving department at the Hathaway Mfg. Co., New Bedford, Mass., has resigned to accept a position as overseer of weaving, drawing-in and slashing at the Booth Mill, New Bedford.

A. F. Bentley has accepted a position as overseer of frame spinning at the Richard Borden Mfg. Co., Fall River, Mass. He was formerly employed at the Nottingham Mill, Providence, R. I.

Joseph Robinson, superintendent of the Orr Felt & Blanket Co., Piqua, Ohio, has severed his connection with that company. Previous to accepting this position he was with the Lockport Felt Co., Newfane, N. Y.

William S. Nason has accepted the position as overseer of finishing at the Somerset Woolen Co., Monson, Mass. He comes from North Billerica, Mass.

Fred Jackson has accepted the position as overseer of dyeing at the Bay State Worsted Co., Worcester, Mass., succeeding Webster M. Pike.

William J. Murray has been appointed superintendent of the Champlain Silk Mills, Whitehall, N. Y. He comes from Bristol, R. I.

James T. Cullen has been appointed designer for S. Slater & Sons, Webster, Mass. He comes from Providence, R. I.

John W. Bullard has been appointed overseer of dyeing for the Woolen Mfg. Co., Beaver Dam, Wis. He comes from Norwalk, Conn.

William G. Jeffrey has been appointed assistant designer at the Gera Mills, Passaic, N. J. He was formerly employed at Saxonville, Mass.

Samuel Holland has been appointed overseer of spinning at the Champlain Silk Mills, Brooklyn, N. Y. He comes from Lawrence, Mass.

Percy Milnes, designer for Willetts, Ltd., Chambly Canton, P. Q., Canada, has severed his connection with that company.

Thomas Hennessey, overseer of carding at the Hebron Mfg. Co., Hebronville, Mass., has severed his connection with that company.

Fred Pulleston, an instructor in the Fall River Textile School, has been appointed superintendent of the Tecumseh Mill of that city, succeeding Robinson Walmsley.

George C. Hinckley, who resigned as treasurer of the Tilton Mill, Valley Falls, R. I., has taken a similar position with the Bristol Mfg. Company, New Bedford, Mass.

John Shaw has accepted the position as overseer of twisting and spooling at the Globe Woolen Co., Utica, N. Y. He was formerly employed at the Lippett Woolen Mill, Woonsocket, R. I.

Daniel Hill has accepted the position as second hand of carding at the Geneva Mills, Providence, R. I. He comes from Oxford, Me.

William A. Slater, Jr., son of Wm. A. Slater of Washington, D. C., and owner of the W. A. Slater Mill, at Jewett City, Conn., has started in at the mill to learn the cotton business. He intends to go through each department taking up the work in each branch to fit himself for a higher position.

William A. Carpenter, for the past 21 years overseer of spinning, spooling and slashing at the Royal Mill, River Point, R. I., has tendered his resignation to accept a similar position with the Pilgrim Mill, Fall River, Mass. His successor is James Dunn, who was formerly employed at the Interlaken Mills, Harris, R. I.

John R. Hilton, master mechanic for a number of years at the American Printing Co.'s mill, Fall River, Mass., has severed his connection with that company after serving 25 years. His place has been filled by his son, Fred, who has been his chief assistant.

Alyn H. Platt, master mechanic at the Dartmouth Mfg. Corporation, New Bedford, Mass., has resigned to accept a similar position with a large mill in Fall River, Mass. He was presented with a gold chain, charm and cuff links by the employes whom he was associated with at the Dartmouth Mill.

James Weeks, overseer of spinning at the Putnam Woolen Co., Putnam, Conn., met with a painful accident, having broken one of the bones in his leg caused by falling from a box.

Henry C. Schueler has accepted a position in charge of weaving at the Uswoco Mill, U. S. Wor-

sted Co., Lawrence, Mass. He was formerly employed as second hand of weaving at the Washington Mill, Lawrence, Mass.

J. F. Clark, who was reported to have accepted the position as superintendent of the Great Falls Mfg. Co., Rockingham, N. C., has since then been promoted from superintendent to general manager of the Echota Cotton Mills, Calhoun, Ga.

D. L. Garrison has accepted the position as night overseer of carding and spinning at the Melville Mfg. Co., Cherryville, N. C. He was formerly employed at the Rosemary Mfg. Co., Rosemary, N. C.

J. B. Cleary has accepted the position as overseer of spinning at the Knoxville Spinning Mill, Knoxville, Tenn. He comes from Trough, S. C.

J. R. McMahan has accepted the position as overseer of spinning at the Franklin Mills, Greers, S. C, succeeding P. M. Tice, who has resigned. Mr. McMahan comes from Arlington, S. C.

G. A. Franklin has accepted the position as overseer of the cloth room at the Orr Cotton Mills, Anderson, S. C.

N. W. Garner, overseer of weaving at the Clinton Cotton Mills, Clinton, S. C., has resigned to accept a similar position with the Banna Mfg. Co., Goldville, S. C.

W. Frank Walker, superintendent of the Monarch Mills, Union, S. C., has resigned to accept a similar position with the Brandon Mill, Greenville, S. C.

H. E. Littlejohn, formerly designer at the Victor Mfg. Co., Greers, S. C., has accepted a similar position with the Greers Mfg. Co., of the same place.

John Patten, overseer of carding, spinning and twisting at the Princeton Mfg. Co., Athens, Ga., has resigned to accept a position with the Whitehall Yarn Mills, Whitehall, Ga.

Eugene Cross, formerly superintendent of the West Point Cotton Mills, West Point, Miss., has accepted a position as manager of the Taylorsville Cotton Mills, Taylorsville, N. C.

A. H. Cottingham, formerly of Dillon, S. C., has resigned as superintendent of the Apalache Mills, Arlington, S. C., to accept a similar position with the Monarch Mill, at Union, S. C.

P. F. Hanlin has accepted the position as overseer of finishing at the Bound Brook Woolen Mills, Bound Brook, N. J. He comes from Bangor, Me.

Edward E. Magner has accepted the position as overseer of dyeing at the Paton Mfg. Co., Sherbrooke. P. Q., Canada. He was formerly employed at the Salt's Textile Mfg. Co., Norwalk, Conn.

R. F. Coble, superintendent of the Kesler Mfg Co., Salisbury, N. C., has resigned to accept a similar position with the Hannah Pickett Mill, High Point. N. C.

E. L Jones, formerly overseer of slashing and drawing-in at the Brandon Mill, Greenville, S. C., has accepted a similar position at the Westervelt Mill, same place.

W. G. Reynolds, formerly superintendent of the Efird Mills, Albemarle, N. C., has accepted a similar position at the Jennings Cotton Mill, Lumberton, N. C.

A. Noblett has accepted the position as overseer of weaving at the Norris Cotton Mill, Cateechee, S. C

M. C. Phillips, formerly overseer of weaving at the Pilot Mills, Raleigh, N. C., has accepted a similar position at the Locke Mills, Concord, N. C.

Noah Shealy has been promoted to overseer of dyeing at the Middleburg Mill, Batesburg, S. C.

Joseph E. Shaw has been promoted to the position of superintendent of the Great Falls Mfg. Co., Rockingham, N. C.

Frank Thompson, overseer of spinning at the Alexander City Cotton Mills, Alexander City, Ala., has resigned to accept a similar position at the Coosa River Spinning Mills, Bon Air, Ala.

W. A. Shoffner has accepted the position as overseer of dyeing at the Eno Mills, Hillsboro, N. C. He comes from Burlington, N. C.

P. P. Jones has accepted the position as overseer of spinning at the Jennings Mill, Lumberton, N. C.

Thomas C. Callaway has accepted a position as secretary and manager of the Milstead Mills, Milstead, Ga. He comes from Atlanta, Ga.

Walter M. Crump has accepted the position as superintendent of the Peck Mfg. Co., Warrenton, N. C. He comes from Starkville, Miss.

S. A. Crutchfield, overseer of carding and spinning at the Pilot Mills, Raleigh, N. C., has resigned.

J. C. Ballard, superintendent of the Howell Mills, Cherryville, N. C., has also been appointed superintendent of the Vivian Mills, of the same place.

Henry B. Thompson, late treasurer of the Joseph Bancroft & Sons Co., Wilmington, Del., has been elected a director and vice-president of the United States Finishing Co. and will assume his duties February 1st, making his headquarters in New York City.

John W. Hillam, formerly overseer of spinning at the Washington Mill, Lawrence, Mass., has resigned to accept a similar position with the Valley Worsted Mills, Providence, R. I.

George W. Foster has recently resigned his position with the Lowell Machine Shop, Lowell, Mass.

George K. Senior has accepted a position as chemist for the Warren Soap Co., Watertown, Mass. He comes from Needham Heights, Mass.

George Meade, formerly representative for the A. H. & C. B. Alling Co., Derby, Conn., has severed his connection with that company. He has associated himself with Chas. Chipman & Sons, 88 Leonard St., New York City. Mr. Meade will look after their interests in the Middle West.

William Hines, overseer of dyeing at the Kent Mfg. Co., Centreville, R. I., has severed his connection with that company.

Daniel Starkey has accepted the position as overseer of knitting at the Middlesex Company, Lowell, Mass. He comes from Wilmington, Del.

William H. Rider, late superintendent for the Edward T. Steel & Co., Bristol, Pa., has accepted a position as superintendent of the Waterhouse & Howard Mill, North Adams, Mass., succeeding James Waterhouse. Mr. Waterhouse is head designer for the mills at North Adams and Blackinton, Mass.

Alfred Riendeau, second hand in the carding department at the Clinton Mills, Woonsocket, R. I., has resigned to accept a similar position with the Bernon Mills, Georgiaville, R. I.

Thomas Thomas, superintendent of the Bay State Mill, American Woolen Co., Lowell, Mass., has severed his connection with that company to accept a similar position in a large mill in Ohio.

Thomas J. Dwire, overseer of burling and sewing at the Arden Mill, Fitchburg, Mass., has resigned to accept a similar position with S. Slater & Sons, Webster, Mass.

John F. Moore has accepted the position as overseer of dyeing for the Kent Mfg. Co., Centreville, R. I.

Frank W. Seavey has accepted the position as overseer of weaving for the Ludlow Mfg. Associates, Ludlow, Mass. He comes from North Vassalboro, Me.

Frank J. Durkan, overseer of weaving at the U. S. Worsted Co., Harrisville, R. I., has resigned to accept a similar position at the Premier Worsted Co., Bridgeton, R. I.

T. J. Connelly, overseer of finishing at the Bound Brook Woolen Mills, Bound Brook, N. J., has severed his connection with that company.

Robert Russell, overseer of spooling, warping, twisting, slashing and drawing-in at the Nashawena Mill, New Bedford, Mass., has severed his connection with that company.

W. H. Walsh, overseer of weaving for the Waterhouse & Howard Worsted Mill, North Adams, Mass., has severed his connection with that company. He has accepted a position as second hand of weaving at the Beoli Mills, Fitchburg, Mass.

Morris W. Wilbur has accepted the position as wool sorter at the LaPorte Woolen Mill, LaPorte, Ind. He comes from Clinton, Mich.

E. A. Carney, overseer of carding at the Woolen Mfg. Co., Beaver Dam, Wis., has severed his connection with that company. He has accepted a similar position with the Stephenson Underwear Co.'s branch mill at Goshen, Ind.

J. C. Mailloux, agent of the Paragon Worsted Co., Providence, R. I., has severed his connection with that company.

Edward Amback has accepted the position as overseer of carding at the Cyril Johnson Woolen Co., Stafford Springs, Conn. He comes from the Medlicott Company, Windsor Locks, Conn., and succeeds A. J. Lemire.

Adolph Pero of Stafford Springs, Conn., has been appointed manager of the newly organized Vivia Worsted Co., of Philadelphia.

W. W. Quinton, overseer of weaving at the Suncook Mills, Suncook, N. H., has resigned and is succeeded by W. T. Woodrow, of Providence, R. I.

J. T. Ryan has accepted the position as overseer of spinning at the U. S. Cotton Co., Central Falls, R. I.

George A. Schofield, superintendent of the Airedale Mills Co., Pittsfield, Mass., has severed his connection with that company.

Frank Casey, superintendent of the Garland Woolen Co., Staffordville, Conn., has severed his connection with that company. S. M. Lambert, who was formerly at this mill, but more recently with the Somerset Woolen Co., Monson, Mass., succeeds him.

Joseph A. Cameron has accepted the position as superintendent of the Sykes Woolen Mills Co., Reynoldsville, Pa., succeeding William G. Ratcliffe

Louis A. Anderson has accepted the position as superintendent of the Wakefield Mfg. Co., Wakefield, R. I. He comes from Winnipauk, Conn.

Frank Orkyard has accepted the position as designed for Willetts, Ltd., Chambly Canton, P. Q., Canada.

James McDougall, agent of the Indian Spring Mill, American Woolen Co., Madison, Me., has succeeded F. H. Jealous as agent of the Vassalboro Mills, North Vassalboro, Me.

Fred Allen has accepted the position as overseer of weaving at the Waterhouse & Howard Worsted Mill, North Adams, Mass. He comes from the U. S. Worsted Co., Harrisville, R. I.

Crawford A. Partelo has accepted the position as overseer of carding at the Cordaville Woolen Co., Cordaville, Mass. He was formerly employed at Marlboro, Mass.

P. H. Walsh, for a number of years connected with E. Lissberger & Co., wool dealers with offices at New York and Boston, has formed a corporation to sell and deal in wool. G. E. Tylee is treasurer and F. T. Fahey, secretary. They have opened an office at 184 Summer St., Boston.

Charles A. Buck, in charge of the worsted drawing for S. Slater & Sons Mill, Webster, Mass., has severed his connection with that company.

Fred Birkby has accepted the position as overseer of dyeing at the Davenport Woolen Mills Co., Davenport, Ia. He comes from the Wallace & Smith Blanket Mills, La Porte, Ind.

F. A. Owen, overseer of dyeing at the Davenport Woolen Mills Co., Davenport, Ia., has severed his connection with that company.

A. N. Hersom has been appointed overseer of weaving at the Edwards Mfg. Co., Augusta, Me., succeeding E. M. Main.

L. W. Irons has accepted a position as overseer of weaving at S. Slater & Sons Mill, Webster, Mass. He comes from the Salt's Textile Mfg. Co., Norwalk, Conn.

B. J. Murphy has accepted the position as overseer of carding at the Darling Woolen Co., Hollis-ton, Mass. He comes from Fall River, Mass.

J. F. Sides has accepted the position as overseer of carding and spinning at the Barringer Mfg. Co., Rockwell, N. C.

James Henry Ables, overseer of spooling and twisting at the Piedmont Mills, Piedmont, Ala., has resigned to accept a position as overseer of spinning at the Alexander City Cotton Mills, Alexander City, Ala.

S. Hodgson has accepted a position with E. G. Carlton & Sons, Rochdale, Mass. Mr. Hodgson comes from Shelton, Conn., and will hold the position as Mr. Carlton's assistant.

C. S. Lord has accepted the position as overseer of finishing at the Great Falls Woolen Co., Somersworth, N. H. He comes from Bridgton, Me.

Fred W. Lane, designer and assistant superintendent of the Indian Spring Mill, Madison, Me., has been appointed agent to succeed James McDougall.

Isaac W. Still, for a number of years bleacher and dyer for the Merrick Thread Co., Holyoke, Mass., but who resigned his position some years ago on account of ill health, died at his home in that city at the age of 80 years. He leaves a widow and one daughter.

Michael J. Kelly, overseer of weaving at the Borden Mill, Fall River, Mass., has severed his connection with that company. He has been in their employ for the past eighteen years.

John J. Ruegg, for many years connected with the silk industry in this country, died at his home in Clifton, N. J. He was a writer of textile books on silk.

Fred Williams, overseer of dressing at the U. S. Worsted Co., Harrisville, R. I., has resigned to accept a similar position with the Premier Worsted Co., Bridgeton, R. I.

William Hesselden has accepted the position as overseer of weaving at the Davenport Woolen Mills Co., Davenport, Ia. He comes from S. Slater & Sons, Webster, Mass.

George W. Merrow has accepted the position as overseer of carding at the Hebron Mfg. Co., Hebronville, Mass. He comes from Lowell, Mass.

John F. Maguire has accepted the position as overseer of finishing at the Lacon Woolen Mills, Lacon, Ill. He comes from Dalton, Mass.

Charles Boyle has accepted the position as overseer of carding and spinning at the Dexter Yarn Co., Pawtucket, R. I.

William J. Murray, superintendent of the Champlain Silk Mill, Whitehall, N. Y., has been transferred to their mill at Brooklyn, N. Y.

M. Robert Weichert has been appointed superintendent of the Duluth Woolen Mill, Duluth, Minn.

John Ford has accepted the position as overseer of burling and sewing at the Franklin Mills, Franklin, N. H.

Nelson Calverly has accepted the position as overseer of burling and sewing at the Arden Mill, American Woolen Co., Fitchburg, Mass.

Frank W. Rowan has accepted the position as overseer of carding at the New York Mills, New York Mills, N. Y.

Frank H. Elgar has accepted a position as overseer of finishing at the Church's Woolen Mill, Wegatchie, N. Y.

David Menzies has been appointed overseer of carding at the Medlicott Co., Windsor Locks, Conn.

E. J. Bourehard has accepted the position of loom fixer at the Niagara Textile Co., Lockport, N. Y.

E. R. Johnson has accepted the position as overseer of dyeing at the Pawcatuck Woolen Co., Westerly, R. I. He comes from Pawtucket, R. I.

J. F. Cahill has accepted the position as machinist for Penman's Ltd., Paris, Ont., Canada.

D. S. Halacy has accepted the position as master mechanic for J. Broadbent & Son, Unionville, Conn.

V. J. Ironside has accepted the position of master mechanic for James & E. H. Wilson, Pittsfield, Mass. He comes from East Douglas, Mass.

Charles McCarthy has accepted the position as overseer of carding at the Bay State Mills, American Woolen Co., Lowell, Mass., succeeding George H. Thomas.

In our December issue we reported Lawrence H. Love as having accepted a position as overseer of weaving at the Berkshire Woolen & Worsted Co., Pittsfield, Mass. This is incorrect. On investigating we find we were misinformed in regard to this.

George A. Heighway, superintendent of the weaving department at the Shuttleworth Mills, Amsterdam, N. Y., has severed his connection with that company.

Leo O. Hammond has accepted the position as second hand of ring spinning at the Chicopee Mfg. Co., Chicopee Falls, Mass.

Thomas Johnson, superintendent of the Cyril Johnson Woolen Co., Stafford Springs, Conn., has severed his connection with that company.

DEATHS

At a recent meeting of the Directors of the Stirling Mills the following resolutions were adopted:

Whereas, The Directors of the Stirling Mills have lost through death their beloved associate and highly esteemed agent, Albion F. Swanton, a man who had been continuously associated with their business interest for more than thirty years as a faithful worker and a most competent and effieient manager, and

Whereas, Their memory of Mr. Swanton is one of most pleasant relations with a man whose evenness of disposition and of temper was most remarkable, whose integrity was beyond question, who was fearless in discharge of his duty, and always willing to assume his full share of the burden.

Resolved, That they have lost a co-worker who can never be excelled and for the loss of whom they can but inadequately express their grief.

John Gregson, president and treasurer of the Buffalo Textile Company, Buffalo, N. Y., died at the age of 61 years. Before going to Buffalo he was connected with a number of cotton mills such as the Merchants Mfg. Co., Fall River, Mass. He was a charter member of the American Cotton Manufacturers' Association.

John Waterhouse, a well known woolen manufacturer, died suddenly at his home in Warwick, R. I., as the result of a shock which he underwent recently. He was born in Yorkshire, Eng., 68 years ago and came to this country in 1843, settling in Greenville, R. I. He also was superintendent at East Greenwich, R. I., and what is known as the Hecla Mill, Uxbridge, Mass. He is survived by a widow, one daughter and two sons.

Claremon Hunt, for a number of years treasurer of the Sterling Dyeing & Finishing Co., which plant was later taken over by the U. S. Finishing Co., of Sterling, Conn., died suddenly at his home in Providence, December 8th. Mr. Hunt was as well as usual Thursday morning, but Friday evening was seized with an attack of acute indigestion and died about an hour later. He is survived by a wife, one son and two daughters.

Edward A. Chace, formerly treasurer of the Seaconnet Mill, Fall River, Mass., and well known throughout the city, passed away at his home in Fall River on Monday afternoon, December 18th, of acute Brights disease, at the age of 58 years. He is survived by one son and a daughter.

John Hanford Dunn, superintendent of the Tremont & Suffolk Mills, Lowell, Mass., and a prominent mill man of that city, died December 23d at his home in that city at the age of 58 years. Mr. Dunn was born in England. Since coming to this country he was connected with several large mills in the New England States and New York State. He had been ill for a few weeks, and is survived by a wife, three daughters and two sons.

Thomas Allen Hersey, overseer of weaving at the Jackson Co., Nashua, N. H., died suddenly, December 25th, at his home in that city. Two years ago he had an apoplectic attack which left his health impaired. He had attended to his duties at the mill regularly until they closed Saturday at noon and had visited his wife at Concord, N. H. Mr. Hersey was born in the State of Maine, Jan. 9, 1852. He is survived by his wife, their only son having been killed in a railroad accident several years ago.

James Henderson, general manager of the Ludlow Mfg. Associates, Ludlow, Mass., died at his home in Ludlow, December 22d, in his sixty-third year, after an illness of several months. He was able to attend to his duties up to the time of his death. Mr. Henderson was one of the foremost residents of Ludlow and was also prominent in Masonic circles.

J. Harper Smith, a wealthy retired woolen manufacturer, died suddenly at his home in Somerville, N. J., at the age of 77 years. For more than forty years he was associated with Feinstein Bros. of Raritan, N. J., in the manufacture of woolen goods. He had drawn several checks to be given to servants for Christmas gifts when he fell into his wife's arms and died instantly. Harry Smith, who was superintendent of the Somerset Woolen Mill, Raritan, N. J., and who died three years ago, was his only son.

John A. Faulkner, one of the best known and most prominent woolen mill men, died December 21st at his home in Lowell, Mass. He was born in Billerica, Mass., Mar. 14, 1855, and educated in the public schools. He was admitted to the firm of L. W. Faulkner & Sons, woolen manufacturers, which is now known as the Bay State Mill, American Woolen Co. Mr. Faulkner was a thirty-second degree Mason and was connected with many organizations in that city. He is survived by a wife, one son and two daughters.

James G. Marshall, paymaster at the Boott Mill, Lowell, Mass., for over thirty-three years, died at his home, December 13th, at the advanced age of 73 years. He had retired from active business some time ago on account of his health. He is survived by a widow and one daughter.

Wm. G. Hackstaff, a retired woolen manufacturer and who formerly lived at Middletown, Conn., died at his home in Morristown, N. J., of heart disease. He was 70 years of age and is survived by a brother, Alexander Hackstaff of New York City.

Benjamin T. Lewis, superintendent of the Aberfoyle Textile Mill, Chester, Pa., died suddenly while returning to his home in a cab. He is survived by a widow and six children.

Arthur W. Parmelee, president of the American Card Clothing Co., and formerly president and treasurer of the Wire Goods Co., of Worcester, Mass., died December 22d at the age of 69 years. He was born in Utica, N. Y., and served in the Civil War.

Ferdinand Lowenthal, secretary and treasurer of the Long Island Knitting Mills, Brooklyn, N. Y., died at his home in Manhattan, N. Y., on Sunday, December 24th. He was taken suddenly ill and expired within a few hours. Heart disease was the cause of his death. He leaves a wife and one daughter, and was born in Wurtemburg, Germany, fifty-six years ago.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

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New Mills.

*North Carolina, Charlotte. The new cotton mill headed by O. A. Robbins of Charlotte will be known as the Thayer Mfg. Co. The capital stock will be $500,000 and a 25,000-spindle and 500-loom mill will be built at Charlotte near the Hoskins Mill. Plans for buildings are being prepared by Mr. Robbins, who will be the engineer in charge and secretary and treasurer of the company.

Pennsylvania, Norristown. Capital has been subscribed for a new cotton mill and land on which to erect buildings has been donated by Adam Scheidt of the Adam Scheidt Brewing Co. The site is on the Stony Creek branch of the Reading Railway, a short distance from the middle of the city. The plant will contain at first 10,000 ring spindles on which carded cotton yarns, about 20s counts, will be made. Ultimately it is the intention of the company to have 60,000 ring spindles to be equally divided between carded and combed yarns. A corporation will be formed with capital stock of $600,000 and A. H. Gulliver, manager of the Wyoming Spinning Co., will have charge and be general manager. The buildings are to be of cement and concrete construction, modern in every respect, and work will be started not later than February 1. An earlier report to the effect that the proposed new company would take over the plant and business of the Wyoming Spinning Co. and enlarge it is incorrect, for as noted in another part of this issue Tonner & Moyer, who occupy a portion of the building occupied by the Wyoming Spinning Co., have leased the equipment of the latter concern and will operate it after January 1, making yarns for their own use and for sale.

Texas, Post City. A cotton sheeting mill will be established at Post City by C. W. Post, the cereal food manufacturer of Battle Creek, Mich. Mr. Post expects to build a mill of 10,000 spindles to use the cotton produced on his 200,000 acres of land outlying Post City. The initial cost will be about $400,000. The product will be finished sheetings, cut, hemmed, laundered and ready for use. All operations will be done from unginned cotton to finished sheetings. H. W. Fairbanks of Dallas, Tex., will have general supervision of the mill, which it is expected will be in operation in time for the 1912 cotton crop.

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Enlargements and Improvements.

Connecticut, Danielson. A shipment of new looms recently arrived for the Connecticut Mills Co., giving total equipment of 50 looms. Cotton fabrics are manufactured from Sea Island and Egyptian cottons.

Connecticut, Uncasville. Work has been started on an addition to the plant of the Uncasville Mfg. Co. The beaming department is to be enlarged.

*Georgia, Rome. Three thousand new spindles and 41 new looms will be installed in the brick addition recently completed for the Anchor Duck Mills.

*Georgia, Tallapoosa. New machinery is now being installed to fill up the space in the buildings of the Tallapoosa Mills, Inc. The mill was originally planned to contain 12,000 spindles and the new installation consists of 2,040 spindles and preparatory machinery which increases the plant from about 10,000 spindles to 12,288 spindles. The power plant was designed to drive this extra machinery.

New Hampshire, Claremont. The addition to the Monadnock Mills, into which the equipment formerly operated by the Union Mfg. Co. of Peterboro is to be installed, is nearly completed and in readiness for the additional machinery. Fifty-eight freight cars will be necessary to move the machinery from Peterboro to Claremont.

North Carolina, Asheville. Announcement is made that the Asheville Cotton Mills, which shut down indefinitely last June, will resume operations at once. This is accompanied by reports that enlargements and improvements calling for an expenditure of about $50,000 will be made, including the construction of a new dye house and new tenements for operatives.

*North Carolina, Belmont. Heretofore carding machinery in the Majestic Mfg. Co.'s mill has been run extra time to take care of the spinning. After the new equipment now being put in, which includes 10 cards, 4 combers, 1 slubber, 1 first intermediate, 2 second intermediates and 7 jack frames, is installed, the departments will be evenly balanced.

North Carolina, Charlotte. Plans are in preparation for an addition to be built to the plant of the Mayes Mfg. Co. at Mayesworth. Contract is said to have been awarded for new machinery equipment to be installed in the addition.

North Carolina, Forest City. It is reported that preparations are being made to begin work on an addition to the Florence Mills. Recently new equipment was installed in the finishing department.

North Carolina, Granite Falls. Contract has been awarded by the Granite Falls Mfg. Co. for the equipment of a steam power plant. A building for this plant has been in course of construction for some time.

North Carolina, King's Mountain. The addition being built for the Phoenix Mfg. Co. will be 72 by 80 ft., and will be completed about the middle

of January. As noted previously, twister spindles will be installed. No other changes are contemplated at the present time.

North Carolina, Landis. It is reported that the stockholders of the Corriher Mills Co. have decided to equip the mill for the manufacture of sheetings. The building was completed over a year ago. C. J. Deal, secretary and treasurer of the Linn Mills Co. of Landis is president of the Corriher Mills Co.

*North Carolina, Marion. On December 21 stockholders of the Marion Mfg. Co. will vote on a proposition to issue an additional $300,000 stock to pay for the enlargements now under way. Good progress is being made on the construction of the addition.

North Carolina, Rockingham. Four new spinning frames have been purchased by the Hannah Pickett Mills. An enlargement, 100 by 235 ft., was built to the plant in 1910.

North Carolina, Wendell. Improvements are being made in the power plant of the Whitley Mfg. Co., including the installation of a Corliss engine and some other changes. This is a small plant of 2,700 ring spindles operated on cotton hosiery yarns.

Pennsylvania, Glen Riddle. Additions and improvements have been made to the dyeing and bleaching house of the Estate of Danel Lees, including the installation of one of the latest improved filters built by Hungerford & Terry, Inc., Philadelphia, which has capacity of 50,000 gallons per day. This company manufactures upholstery velours on 40 narrow and 8 broad looms.

Rhode Island, Woonsocket. Work has been started excavating for the foundation for a new brick addition to the Globe Mill of the Manville Co., 50 by 50 ft., 1 story high, to be equipped as a picker room.

South Carolina, Chester. Six hundred and forty looms will be installed in the new weave shed of the Wylie Mill. This equipment will be set up soon after the first of the year, or as soon as the building is ready to receive it. Good progress is being made on construction work.

*South Carolina, Greers. The addition to the plant of the Greers Mfg. Co., which was started in the late summer, is completed and machinery is being set up. The new equipment will consist of 14,000 spindles and 450 looms.

*South Carolina, Whitmire. Contract has been awarded by the Glenn-Lowry Mfg. Co. for enlargements and improvements at a total cost of $600,000.

South Carolina, Woodruff. Contract for 6 cards and 2,400 spindles has been awarded by the W. S. Gray Cotton Mill. 2/30s to 2/50s combed Peeler yarns on skeins, warps and cones are manufactured on 11,520 spindles. W. H. Gray is the buyer.

Tennessee, Shelbyville. It is reported that contract has been awarded by the Sylvan Cotton Mills for additional spindles and looms.

Mills Starting Up.

Georgia, Atlanta. The old Elizabeth Cotton Mills, which have been shut down since last spring owing to bankruptcy proceedings, have been put in operation by the Martel Mfg. Co., a new corporation organized under the laws of the State of New York, with capital stock of $200,000. In October the property was purchased by G. E. Huggins of the Farish-Stafford Co. of New York, for $81,000. Since the purchase a force of men has been at work repairing and putting things in shape. Fancy weave goods will be made on dobby looms under the management of W. C. Martin, secretary of the company, formerly of Atlanta, but later connected with the Exposition Cotton Mills and the Farish-Stafford Co., and J. E. Yarborough, the former superintendent.

Georgia, La Grange. It is expected the Dunson Mills will begin manufacturing by Jan. 1. Work was started on buildings last April, including a 2-story main mill and a 1-story weave shed, 132 by 572 ft. These buildings are practically completed and the equipment is now being installed. Power will be furnished by a complete steam plant to drive equipment of 20 000 spindles and 400 looms to be operated on ducks, drills, sheetings, twills and similar goods. The capital stock of this concern is $500,000. J. E. Dunson is president; T. J. Thornton, treasurer and W. S. Dunson, superintendent and buyer.

Massachusetts, Fall River. The carding department in the new Charlton Mills is in full operation and many of the spinning frames have been started. Spoolers and warpers are being filled up and, as many of the looms have been set in place, it is expected that cloth will be produced early next month. Fine and fancy cotton goods will be made.

Massachusetts, New Bedford. Pierce Bros., Ltd., will start up the plant on full production as a result of orders received. It is said that part of the machinery which has not been in operation since the mill was built will be started up.

*Mississippi, Meridian. It was recently reported that the Meridian Cotton Mills would be reorganized and the plant started up after an idleness extending over several months. I. Marks, H. M. Threefoot, E. Cahn and other business men of Meridian have organized the Lauderdale Cotton Mills with capital stock of $130,000 to succeed the old company and the mill will shortly be put in operation.

North Carolina, Bessemer City. The Osage Mfg. Co., which has not been in operation since last May, will resume manufacturing about the first of the year. This was decided at a recent meeting of the stockholders.

Vermont, Burlington. It is reported the Chace Mills, which have been idle since early in the summer, will resume operations soon. John H. Estes and Joseph A. Baker, president and treasurer, respectively, were here recently from Fall River, looking over the plant and noting what work is necessary before manufacturing is resumed. It is rumored that some new machinery

will be installed. During the period of idleness many repairs and alterations have been made, including a new roof on the weave room and repairs on the dam.

WOOLEN.

Enlargements and Improvements.

Connecticut, Central Village. An addition is to be built for the Central Worsted Co. to be used for weaving. Material is arriving. This concern has bought the looms of the Danielson Worsted Co. at Danielson, and will put them in the new addition, giving them a total of 30 looms. The present plant is being operated day and night.

Maine, Lisbon Falls. Work has been started on a new dye house for the Worumbo Mfg. Co. Temple Bros. of Lewiston have the construction contract.

Maine, Skowhegan. The new boilers have been installed in the Anderson Mills of the American Woolen Co. to take the place of three old boilers. The new equipment will increase the steam capacity about one-third.

Maine, Springvale. The new equipment of the Springvale Spinning Co. is being put in place as fast as space is completed in the addition.

Massachusetts, Farnumsville. Two 50 h. p. motors are being put in the Wuskanut Mill, S. Slater & Sons, Inc. Power will be supplied from the wires of the Worcester Suburban Electric Co.

Massachusetts, Millbury. A new iron smoke stack is being erected at No. 2 Mill of the Mayo Woolen Co.

*Massachusetts, North Adams. Contract for rebuilding the boiler house of the Johnson Mills, recently acquired by the Hoosac Worsted Mills, and for general repairs of all sorts, including putting new roofs on the buildings, has been awarded to H. C. Wood & Co. and work has been started.

Massachusetts, Uxbridge. New equipment is being installed in the spinning department of the Davis & Brown Woolen Co. to replace five old jacks that have been broken up. The plant is shut down until January 8.

Massachusetts, Uxbridge. A 25 h. p. boiler is being installed by the Uxbridge Worsted Co. to increase the capacity of the power plant. A plan is being considered to do away with the expensive hauling of fuel by erecting a trestle across the river for a narrow gauge railroad where cars can be filled at the tracks of the railroad company and be run directly into the boiler room of the mill.

Massachusetts, Worcester. A new set of cards, a 300-spindle mule and 14 new looms are to be installed in the plant of the Geo. E. Duffy Mfg. Co. and construction is now under way to provide space for this increase. This will be completed about February 1. Geo. E. Duffy is president, treasurer and buyer.

Minnesota, Fergus Falls. Arrangements are being made by the Fergus Falls Woolen Mills to enlarge the plant. It is estimated that about $20,000 will be expended. Blankets, flannels, also ribbed underwear and fancy knit goods are manufactured.

*New Jersey, Paterson. The Niagara Shawl Co., previously reported removing to a new location, has established its plant at 99 River St. Worsted honeycomb and fancy woven shawls are manufactured on present equipment of 8 looms and this number will shortly be increased. Michael Myers is the proprietor and buyer.

New York, Cohoes. Frank B. Graves, waste manufacturer and dealer of Albany, has purchased the Commercial Mill, formerly operated by the Roff Underwear Co. on sweaters. This is a six-set mill. Mr. Graves intends to dismantle it and equip with the latest improved garnett machinery for the manufacture of cotton, wool, worsted and merino shoddies, etc. According to plans, the plant will be newly equipped and in operation about March 1, 1912.

New York, Little Falls. Work has been started on the erection of an addition to the plant of the Little Falls Felt Shoe Co. to be of modern brick construction.

North Carolina, Elkin. A concrete dam has been built by the Chatham Mfg. Co., which increases the water power available for the mill.

*Nova Scotia, Amherst. Among other changes to be made at the Hewson Woolen Mills is the lengthening of the spinning mules. It has been reported previously that the controlling interest of this company has been secured by Stansfield's, Ltd., and that enlargements may be built in the spring, which is probably correct, although the arrangements for the controlling interest to be taken over by Stansfield's, Ltd., have not yet been completed. Nothing will be finally decided in regard to enlargements until this matter is definitely settled.

Pennsylvania, New Cumberland. The Susquehanna Woolen Co., manufacturers of woolen blankets on 3 sets and 30 looms, with dyeing, finishing and bleaching department, are erecting a three-story brick addition, 52 by 60 feet. The first floor of the structure will be used for dyeing purposes and the installation of 10 new broad looms. The spinning department on the second floor will be increased by another set and the third floor will be devoted to finishing purposes. A new power plant was installed by the company several months ago for both electric and steam power.

Rhode Island, Bristol. The small addition to the Cranston Worsted Mills, under construction, is for a power plant. It will be completed in about three months.

Vermont, Burlington. A building at the corner of Battery and King Sts. has been leased by the American Woolen Co. and repairs and alterations are in progress to prepare it for burling and mending departments which were burned out recently in the destruction of the Hibbard Block.

*Vermont, Springfield. At the present time the John T. Slack Corp., which recently merged the plants of John T. Slack and W. H. H. Slack &

Bro., are putting in 15 additional sets of cards which they expect to be ready for operation about January 1. It is the company's intention to build a cement dye house in the spring, as recently noted, and other additions are contemplated, but have not been definitely decided upon.

West Virginia, Keyser. An additional building will be erected by the Patchett Worsted Co. and machinery installed to manufacture woolen goods. At present worsted yarns are manufactured on equipment of 4 cards, 5 combs and 2,400 spindles.

Wisconsin, Baraboo. The Island Woolen Co. has resumed manufacturing after an idleness of two months, during which a new flume was built which will increase the power capacity.

Wisconsin, Sheboygan Falls. Four new looms are being installed by the Brickner Woolen Mills Co. to replace old equipment.

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Mills Starting Up.

*Massachusetts, Franklin. Machinery is being started gradually at the new plant of the Clark-Cutler-McDermott Co., and it is expected that it will be running in full at an early date.

Massachusetts, Wales. The Berkley Woolen Mill, later known as the Massachusetts Textile Mfg. Co., has been leased for one year to the Germania Mills of Holyoke, who will put the plant in operation at once. Men are at work making repairs and putting things in shape to begin operations. The mill contains 4 sets of cards and 20 looms, which will be operated in connection with the Holyoke mill of the Germania Co. This plant is run by steam and water power and has finishing department and dye house for raw stock, yarn and piece dyeing.

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Mills Shutting Down.

Massachusetts, Rockville. The American Felt Co. has decided to close the Rockville mill indefinitely. Current reports that the mill will be dismantled and the equipment removed to other mills of the company are premature, as no decision in regard to this step has been reached, although it is believed that the felt company will not start up the mill again.

KNIT.

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New Mills.

Illinois, Chicago. The Chicago Hosiery Mills Co., recently incorporated, will locate at 2100 Marshall Boulevard, and will take over the equipment formerly operated at 1935 W. 13th St., under the style of the Eagle Hosiery Mills, by H. M. Kahn, which will be increased by the addition of 20 new machines for the manufacture of hosiery. Theo. Bear, a manufacturer of children's cloaks, now at 107 S. Market St., is secretary of the new Chicago Hosiery Mills Co. and will move his plant to the same building. The product of the hosiery plant will consist of medium grade hosiery for men, women and children, to be sold direct. Julius Heldman is president; H. M. Kahn, vice-president; Isaac Deutch, treasurer, and Theo. Bear, secretary.

*Indiana, Goshen. The new Rock Run Mills started operations January 1. Alterations have been completed on the building and the plant has been practically fully equipped to manufacture men's fine gauge flat web underwear of wool, cotton and merino, and includes 2 sets of wool cards and 1,200 spindles. Steam and electricity will be used for motive power. As noted previously, the capital stock is $75,000, of which $70,000 is paid in. W. L. Stephenson is treasurer, and D. K. Stephenson, superintendent and buyer. These men are sons of B. C. Stephenson of the Stephenson Underwear Mills at South Bend.

*Maine, Ellsworth. As an inducement for the projected knitting mill to be established here the Bar Harbor & Union River Power Co. will furnish electric power, if the mill is established within six months, at an unusually low rate for one year with an agreement to charge at the end of that period not more than three cents per kw. The owners of the Union Shoe Factory where it is proposed to establish the knitting plant have made a liberal offer of free rent for the building for a period of three years with option of purchase at the end of that period for $5,000. A stock company will be formed with $15,000 capital supplied by the manufacturers, who it is understood are Philadelphia men, and $15,000 subscribed by local citizens and business men. The project is being agitated with zeal and it is probable the plant will be established. C. L. Morang is chairman of the committee of the Merchants Association which has the matter in hand.

*Massachusetts, East Douglas. The foundation for the mill to be occupied by the new Tallyho Knitting Co. is being put in and the building, which will be a 2-story structure to cost about $3,000, will be rushed to completion. A few machines will be set up in the loft of the town water pumping station at once to turn out a line of samples. As noted previously, this concern will manufacture sweaters. Ernest A. Wye, formerly of Needham, is the manager.

New York, Cold Spring. The C. F. Hoag Co. of Poughkeepsie have just started a branch glove and mitten plant at Cold Spring which will give employment to about 100 hands and be in operation early in January. Another branch plant is operated by this concern at Milton.

New York, Johnstown. The Wessels Knitting Co. has been organized by Irvin and Bert Wessels and Everett and Martin Kennedy to manufacture seamless knit glove linings. The Wessels brothers have been manufacturing at 6 Spring St. under the style of the Adirondack Knitting Mill.

Ohio, Cincinnati. About a year ago we reported that P. Goldsmith's Sons contemplated starting a knitting plant to make baseball stockings. The plant will be established in January at John and Findlay Sts. to make golf and athletic hosiery, sweaters and bathing suits of cotton, wool and worsted, using 2/10s cotton, 2/20s and 4/18s worsted. Hugo Goldsmith will attend to the buying.

Ohio, Cleveland. The Keller Knitting Co. has been incorporated with capital stock of $25,000 and will make the better grades of men's, boys' and possibly some ladies' knit coats, selling them to the retail trade. Manufacturing will be started with 11 knitting machines and 6 sewing machines. The temporary address is 7108 Hough Ave., but after February 1 the factory will be located at 1538 East 49th St. Wm. A. Keller, connected with the May Co., a large department store in Cleveland, heads this new company.

Pennsylvania, Allentown. A new concern known as the Rexall Knitting Co. has leased the fourth floor of the building at 18 North Church St. and will install as initial equipment ten knitting machines for manufacturing a line of fine silk neckties. The company will be incorporated with capital stock of $10,000. G. W. Martin, formerly superintendent of the Southdown Knitting Co., will be superintendent of the new plant. The production will be sold direct.

Pennsylvania, Philadelphia. T. P. McCutcheon & Bro., Inc., of 11th and Arch Sts., have leased the upper floor of the mill at 249 Cullon St., Germantown, in which they have installed 12 knitters, which they are operating on fine silk neckwear, which they are selling direct.

Pennsylvania, Philadelphia. The Continental Eiderdown Co., Lena and Armat Sts., with Wilson H. Brown as president; Stanley R. Stager, treasurer, and Arthur J. Unsworth, manager, are operating 24 spring needle knitters and 4 latch needle knitters on eiderdowns, selling the production through Brown & Bowers, Philadelphia.

Pennsylvania, Philadelphia. John B. Barker, formerly of the firm of Clark & Barker, is operating 24 knitters and 5 sewing machines on women's seamless cotton and mercerized hosiery under the name of the Matrik Hosiery Company at 5120 Wakefield St., Germantown. The production is sold direct.

Pennsylvania, Pottsville. The Acme Knitting Co., Fegley & Graver proprietors, have installed 8 knitters on which they are manufacturing a line of women's ribbed vests.

*Rhode Island, Providence. A hosiery plant to have in the neighborhood of fifty machines at the start is to be established by the Standard Textile Co., incorporated in November with capital stock of $100,000, as reported. The concern has an office at 512 Howard Bldg., Providence. J. Frank Sunderland is vice-president. Other men interested are John T. McKee and John E. Boland.

*Wisconsin, Milwaukee. The Koenig Knitting Co., recently reported incorporated with capital stock of $5,000, has established a hosiery plant, consisting of six machines, at 390 Hanover St., and employment is given to four hands. Charles H. Koenig is president and superintendent and Eugene C. Koenig is treasurer.

*Wisconsin, Milwaukee. Armin Rosenberg, 3218 1/2 McKinley Blvd., is interested in starting a new plant for the manufacture of fancy knit goods. A company is to be formed under the style of the Reliable Knitting Works, of which Armin Rosenberg will be president, treasurer and buyer, and Samuel Rosenberg, superintendent. The capital stock will be $5,000. Manufacturing will begin with equipment of 12 knitting machines and Mr. Rosenberg expects that everything will be in readiness to begin the production of goods by the first of January.

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Enlargements and Improvements.

*Canada, Ontario, Walkerton. S. A. Rife & Co. will operate the old plant of the Walkerton Hosiery Co. which they recently purchased, and expect to start up in about a month, or as soon as the power dam now building is completed. This concern has been manufacturing clothing in Walkerton, employing about 20 people. S. A. Rife is the buyer.

*Illinois, Collinsville. The branches of the Chester Knitting Mills formerly operated at Sparta and Pinkneyville have been combined in the new mill at Collinsville. The main plant is at Chester.

Illinois, Joliet. An increase has been made in the equipment of the Buchanan-Lawrence Co. to 2 cards, 12 knitting machines and 15 sewing machines. Lamb's wool soles and crocheted slippers are made and 2/30s to 2/20s and 4/20s worsted and merino yarns are bought. W. M. Buchanan is president and buyer.

*Indiana, Fort Wayne. The work of building the new addition for the Wayne Knitting Mills has been carried to a point where machinery can be installed and equipment that has been imported is expected to arrive in a few days. This new machinery will make necessary the employment of 200 more hands. The basement and fourth floor of the new mill will be used for storage, while the other floors will be equipped with machinery. A large water storage tank is being placed on the new building. The office quarters have been undergoing repairs and rearrangements for the past few weeks and a private telephone exchange has been installed.

*Maine, Brunswick. Turner C. Hunton, proprietor of the Brunswick Knitting Mill, who recently reestablished this plant following the fire of a year ago, will add to the present equipment of ten knitting machines some time in the spring. Women's gauze stockings are manufactured, 220-needle goods, with high spliced heel and double sole.

Missouri, St. Louis. During the coming spring the finishing plant and office of the Chester Knitting Mills, Chester, Ill., will be moved to the factory building at 4th and Spruce Sts., St. Louis, which the company leased for a period of ten years. Changes are to be made in the building to adapt it for dyeing and finishing, as noted in an earlier report. After these changes are made all the finishing for the plants at Chester and Collinsville, Ill., will be done in St. Louis.

New Jersey, Bloomfield. Blanchard & Price of 142 Fifth Ave., New York, are operating a plant here on knitted silk neckties in which they have

recently installed one of the latest improved silk winders.

New Jersey, Camden. There is a good prespect that the knitting department of the Highland Worsted Mills will be doubled during the coming year. This department contains at present 9 flat knitting machines and 8 sewing machines operated on Shaker sweaters. H. G. Balderston is the superintendent.

New York, Elmira. Contract has been awarded by the Ironwear Hosiery Co. for additional machinery.

New York, Highland. Two electric motors have been installed in the Highland Knitting Mill to take the place of a gasoline engine which has heretofore supplied power.

New York, New York City. The Franklin Knitting Mills at 511 E. 72d St., who are operating a plant on the manufacture of knitted silk neckties, have recently installed one of the latest improved necktie steamers and finishing machines.

New York, New York City. The Leinkram Knitting Mills, 777 Broadway, manufacturers of knit ties, contemplate making an addition to their plant. Plans have not been completed. Max Leinkram is buyer and superintendent.

New York, St. Johnsville. The large addition to the Royal Dept. of the Union Mills which has been under construction for several months has been completed and a sprinkler system installed. The addition will allow the company to practically double the output of this department and give employment to about 200 extra hands when fully equipped. The new structure is two stories and basement, 239 feet long. Knitting and finishing machinery is to be installed, but probably nothing will be done in this direction until spring, as full details of the new machinery have not been decided.

North Carolina, Durham. The Durham Hosiery Mills have contracted with the Southern Power Co. for electric power to operate the plant at East Durham.

North Carolina, Newton. New knitting machinery is being installed in the plant of the Fidelity Hosiery Mills, Inc., to make a finer grade of hosiery. It is stated further that when the proposed addition is completed other fine gauge machines will be added and a line of silk hosiery made.

*Ohio, Toledo. Four knitting machines and one ribber represent the increase recently made by the Dolphin Hosiery Co.

Pennsylvania, Lehighton. The Carbon Knitting Co. is manufacturing women's and children's flat underwear and union suits on 7 knitters and 8 sewing machines and reports being exceedingly busy. The company has in contemplation the installation of sufficient new machinery to double the production. Walter Drumheller is superintendent and buyer.

Pennsylvania, New Cumberland. The New Cumberland Knitting Mills, of which J. J. Baughman is the president and treasurer, and W. M. Smith, superintendent, manufacturing seamless cotton half hose on 81 knitters, 20 ribbers, 15 loopers and 36 embroidering machines, are very busy. For the purpose of increasing their facilities they have recently built a new addition, 72 by 38 feet, two stories and basement, of brick. New loopers and knitting machines, which have not yet been ordered, will be installed at a later date. They sell through Robert P. Steele & Co., New York.

Pennsylvania, Philadelphia. The Modern Knitting Mills now at 310 Carpenter St., with S. Aarons, Hyman Shorr and William Gordon as owners, are manufacturing a line of silk knitted ties on 5 knitters and 1 sewing machine. The plant will be removed to other quarters some time during the coming year and enlarged and ladies' worsted hand knitted caps will also be manufactured. They sell direct.

Pennsylvania, Philadelphia. According to report the Oneida-Regal Textile Co., whose main plant in Philadelphia is located at 2d and Allegheny Aves., with a dye house at Tioga and Aramingo Sts., contemplates the building of a new plant for dyeing in which they will install new equipment. Robt. Lee is superintendent of this department. This is one of the mills of the Oneida-Regal Textile Co. which combined knitting mills in Waterville, Syracuse, Stittville and Oneida, New York and Philadelphia during the past year. Chas. A. Byington of Utica, N. Y., is the general buyer.

Pennsylvania, Philadelphia. The H. L. Munz Hosiery Co., whose plant at 2707-13 N. Palethorp St., was destroyed by fire some time ago, is again in full operation on high grade silk hosiery. The mill is very busy.

Pennsylvania, Philadelphia. The Modern Knitting Mills have removed from 310 Carpenter St. to 18 North 4th St., where larger quarters have been secured. Two new knitting machines will be installed. Knitted silk neckties are manufactured.

Pennsylvania, Pottstown. The Gold Seal Hosiery Mills, who succeeded to the business of the Gold Seal Knitting Mill, and whose plant was burned out several months ago, have opened offices at 55 South Evans St., with the intention of securing other quarters and equipping for the purpose of manufacturing cotton, silk and mercerized hosiery for men and women. They are now buying hosiery from other manufacturers for the purpose of supplying their trade until their new plant is in operation. S. D. Davenport is the president and manager and E. D. Gudebrod, treasurer.

Pennsylvania, Pottstown. The Vaughan Knitting Co., of which Andrew Vaughan is the president and superintendent, is very busy with business booked for both immediate and future delivery. New additions to the plant have been erected and preparations are being made for their equipment. The plant is run on silk and mercerized half hose of the highest grade, which is sold direct from the mill.

Pennsylvania, Reading. The American Hosiery Mfg. Co., reported incorporated a short time ago

with authorized capital stock of $150,000, succeeds A. F. Barto, a manufacturer of seamless hosiery at Chestnut and Miflin Sts. A. F. Barto has been elected president and L. O. Barto, secretary and treasurer. It is planned to enlarge the plant and put branded hosiery on the market. At present 50 knitting machines, 10 ribbers and 5 loopers are operated on 144 to 200-needle goods.

Pennsylvania, Robesonia. A new boiler has been installed in the Robesonia Knitting Mills, manufacturers of seamless cotton half hose.

Pennsylvania, Slatington. An increase has been made in the equipment of the Crystal Knitting Mills, giving them 85 knitting machines and 14 loopers. The concern is manufacturing men's seamless half hose and reports doing an excellent business.

Pennsylvania, Wilkes-Barre. Marshall & Hohl, have changed the name of their plant from the Diamond City Knitting Mill to the Anthracite Hosiery Mills. The mill, which has been shut down for several months, is being re-equipped with 15 new knitters for making 220-needle women's seamless hosiery, to take the place of 176-needle goods which they made in the past. Samples are now on the market and the plant is expected to be in operation within a short time.

Wisconsin, Beaver Dam. The Paramount Knitting Co. of Chicago has purchased the building of the old Beaver Dam Cotton Mills and it is reported will eventually use all the space for a knitting factory. The main building is 3 stories high with about 55,000 sq. ft. of floor space. For some time past the Paramount Knitting Co. has leased one of the floors.

*Wisconsin, Portage. In the spring the Portage Hosiery Co. expect to build a fireproof warehouse. Repairs are now being made on the old warehouse recently damaged by fire.

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Mills Starting Up.

*Maryland, Thurmont. At the branch of the Union Mfg. Co., 20 latch needle cylinder knitting machines have been installed and are operating on cotton seamless half hose. All goods made at this branch are sent to the mill at Frederick unfinished and all purchases are made at the main mill. 10s to 20s cotton yarns are used.

*Michigan, Ypsilanti. The Oak Knitting Co. of Syracuse, N. Y., has secured the plant and trade marks of the Ysilanti Underwear Co. and will operate the mill as a branch, calling it Oak Knitting Co., Mill No. 3. The mill is a 6-story building on the bank of the Huron River, with 160 water h. p., containing 250 knitting machines and 150 sewing machines for making men's, women's and children's union suits, two piece underwear, tights and similar goods. Fifteen new knitting machines will be added to this equipment. The mill will be put in operation late in January, under the management of John B. Bringloe, formerly of Richfield Springs, N. Y. The buying will be done by A. G. Velasko of Syracuse, treasurer of the Oak Knitting Co.

New Jersey, Camden. The Camden Manufacturing Co. is the name of the new concern, which will soon be incorporated, and which has recently taken over the plant formerly operated by the Merrimac Manufacturing Co., at West and Senate Sts. The new owners are now putting the machinery, consisting of ten knitters and ten sewing machines, into condition for the manufacture of women's swiss ribbed underwear, cotton and lisle, and a line of athletic shirts for men and boys, which they will sell direct.

*Pennsylvania, Allentown. The officers of the Lehigh Mills Corp., which as noted in previous reports has succeeded the Southdown Knitting Co., are J. A. Hartzell, M. D., president; John A. Kepperman of Reading, treasurer, and Wm. S. Nowell, manager. The new company is manufacturing the same line of goods that were made previously in the plant and has opened selling offices at 85 Worth St., New York. The capital stock is $100,000.

Pennsylvania, Allentown. The equipment of the old Lehigh Knitting Mills at 722 Linden St. has been taken over by a new concern known as the Alpha Knitting Co. The plant has been shut down for some time. E. J. Steltz is treasurer of the new concern and J. F. Thompson is superintendent. This concern is operating 15 knitting machines and 12 sewing machines on women's ribbed underwear and children's waists. They have sufficient business on hand to keep all the machinery running day and night for some time to come. Clift & Goodrich, New York, are the selling agents.

Pennsylvania, Pottstown. The Arion Knitting Co., which has been shut down for a year or more, is arranging for the starting up of the plant. New parties have taken hold, and equipment is being put into condition for operation and it is expected the plant will be started up any day on men's, women's and children's seamless cotton and mercerized hosiery. The plant contains 94 knitters, 46 ribbers, 8 loopers and 4 sewing machines. The production will be sold direct.

Pennsylvania, Somerset. The plant formerly operated by Cook, Emert & Co., Inc., which was idle for a long time, has been started up under the style of the Cook Woolen Mill. Jonas M. Cook is the sole proprietor and Lemuel R. Barkley is the superintendent and buyer. Men's and women's seamless hosiery, lumbermen's socks, shawls and similar goods are made from woolen yarns, also yarns are made for sale.

Pennsylvania, South Bethlehem. Organization has been effected by the South Bethlehem Knitting Works, incorporated in October with capital stock of $10,000 with A. C. Graham, president; Osmon F. Reinhard, treasurer, and Geo. D. Robbins, general manager and buyer. As noted previously in the report of the incorporation of this company, it succeeds to the plant of Geo. D. Dobbins, which was sold at bankruptcy sale in September.

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Pennsylvania, New Cumberland. The New Cumberland Knitting Mills, of which J. J. Baughman is the president and treasurer, and W. M. Smith, superintendent, manufacturing seamless cotton half hose on 81 knitters, 20 ribbers, 15 loopers and 36 embroidering machines, are very busy. For the purpose of increasing their facilities they have recently built a new addition, 72 by 38 feet, two stories and basement, of brick. New loopers and knitting machines, which have not yet been ordered, will be installed at a later date. They sell through Robert P. Steele & Co., New York.

Pennsylvania, Philadelphia. The Modern Knitting Mills now at 310 Carpenter St., with S. Aarons, Hyman Shorr and William Gordon as owners, are manufacturing a line of silk knitted ties on 5 knitters and 1 sewing machine. The plant will be removed to other quarters some time during the coming year and enlarged and ladies' worsted hand knitted caps will also be manufactured. They sell direct.

Pennsylvania, Philadelphia. According to report the Oneida-Regal Textile Co., whose main plant in Philadelphia is located at 2d and Allegheny Aves., with a dye house at Tioga and Aramingo Sts., contemplates the building of a new plant for dyeing in which they will install new equipment. Robt. Lee is superintendent of this department. This is one of the mills of the Oneida-Regal Textile Co. which combined knitting mills in Waterville, Syracuse, Stittville and Oneida, New York and Philadelphia during the past year. Chas. A. Byington of Utica, N. Y., is the general buyer.

Pennsylvania, Philadelphia. The H. L. Munz Hosiery Co., whose plant at 2707-13 N. Palethorp St., was destroyed by fire some time ago, is again in full operation on high grade silk hosiery. The mill is very busy.

Pennsylvania, Philadelphia. The Modern Knitting Mills have removed from 310 Carpenter St. to 18 North 4th St., where larger quarters have been secured. Two new knitting machines will be installed. Knitted silk neckties are manufactured.

Pennsylvania, Pottstown. The Gold Seal Hosiery Mills, who succeeded to the business of the Gold Seal Knitting Mill, and whose plant was burned out several months ago, have opened offices at 55 South Evans St., with the intention of securing other quarters and equipping for the purpose of manufacturing cotton, silk and mercerized hosiery for men and women. They are now buying hosiery from other manufacturers for the purpose of supplying their trade until their new plant is in operation. S. D. Davenport is the president and manager and E. D. Gudebrod, treasurer.

Pennsylvania, Pottstown. The Vaughan Knitting Co., of which Andrew Vaughan is the president and superintendent, is very busy with business booked for both immediate and future delivery. New additions to the plant have been erected and preparations are being made for their equipment. The plant is run on silk and mercerized half hose of the highest grade, which is sold direct from the mill.

Pennsylvania, Reading. The American Hosiery Mfg. Co., reported incorporated a short time ago

with authorized capital stock of $150,000, succeeds A. F. Barto, a manufacturer of seamless hosiery at Chestnut and Miflin Sts. A. F. Barto has been elected president and L. O. Barto, secretary and treasurer. It is planned to enlarge the plant and put branded hosiery on the market. At present 50 knitting machines, 10 ribbers and 5 loopers are operated on 144 to 200-needle goods.

Pennsylvania, Robesonia. A new boiler has been installed in the Robesonia Knitting Mills, manufacturers of seamless cotton half hose.

Pennsylvania, Slatington. An increase has been made in the equipment of the Crystal Knitting Mills, giving them 85 knitting machines and 14 loopers. The concern is manufacturing men's seamless half hose and reports doing an excellent business.

Pennsylvania, Wilkes-Barre. Marshall & Hohl, have changed the name of their plant from the Diamond City Knitting Mill to the Anthracite Hosiery Mills. The mill, which has been shut down for several months, is being re-equipped with 15 new knitters for making 220-needle women's seamless hosiery, to take the place of 176-needle goods which they made in the past. Samples are now on the market and the plant is expected to be in operation within a short time.

Wisconsin, Beaver Dam. The Paramount Knitting Co. of Chicago has purchased the building of the old Beaver Dam Cotton Mills and it is reported will eventually use all the space for a knitting factory. The main building is 3 stories high with about 55,000 sq. ft. of floor space. For some time past the Paramount Knitting Co. has leased one of the floors.

*Wisconsin, Portage. In the spring the Portage Hosiery Co. expect to build a fireproof warehouse. Repairs are now being made on the old warehouse recently damaged by fire.

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Mills Starting Up.

*Maryland, Thurmont. At the branch of the Union Mfg. Co., 20 latch needle cylinder knitting machines have been installed and are operating on cotton seamless half hose. All goods made at this branch are sent to the mill at Frederick unfinished and all purchases are made at the main mill. 10s to 20s cotton yarns are used.

*Michigan, Ypsilanti. The Oak Knitting Co. of Syracuse, N. Y., has secured the plant and trade marks of the Ysilanti Underwear Co. and will operate the mill as a branch, calling it Oak Knitting Co., Mill No. 3. The mill is a 6-story building on the bank of the Huron River, with 160 water h. p., containing 250 knitting machines and 150 sewing machines for making men's, women's and children's union suits, two piece underwear, tights and similar goods. Fifteen new knitting machines will be added to this equipment. The mill will be put in operation late in January, under the management of John B. Bringloe, formerly of Richfield Springs, N. Y. The buying will be done by A. G. Velasko of Syracuse, treasurer of the Oak Knitting Co.

New Jersey, Camden. The Camden Manufacturing Co. is the name of the new concern, which will soon be incorporated, and which has recently taken over the plant formerly operated by the Merrimac Manufacturing Co., at West and Senate Sts. The new owners are now putting the machinery, consisting of ten knitters and ten sewing machines, into condition for the manufacture of women's swiss ribbed underwear, cotton and lisle, and a line of athletic shirts for men and boys, which they will sell direct.

*Pennsylvania, Allentown. The officers of the Lehigh Mills Corp., which as noted in previous reports has succeeded the Southdown Knitting Co., are J. A. Hartzell, M. D., president; John A. Kepperman of Reading, treasurer, and Wm. S. Nowell, manager. The new company is manufacturing the same line of goods that were made previously in the plant and has opened selling offices at 85 Worth St., New York. The capital stock is $100,000.

Pennsylvania, Allentown. The equipment of the old Lehigh Knitting Mills at 722 Linden St. has been taken over by a new concern known as the Alpha Knitting Co. The plant has been shut down for some time. E. J. Steltz is treasurer of the new concern and J. F. Thompson is superintendent. This concern is operating 15 knitting machines and 12 sewing machines on women's ribbed underwear and children's waists. They have sufficient business on hand to keep all the machinery running day and night for some time to come. Clift & Goodrich, New York, are the selling agents.

Pennsylvania, Pottstown. The Arion Knitting Co., which has been shut down for a year or more, is arranging for the starting up of the plant. New parties have taken hold, and equipment is being put into condition for operation and it is expected the plant will be started up any day on men's, women's and children's seamless cotton and mercerized hosiery. The plant contains 94 knitters, 46 ribbers, 8 loopers and 4 sewing machines. The production will be sold direct.

Pennsylvania, Somerset. The plant formerly operated by Cook, Emert & Co., Inc., which was idle for a long time, has been started up under the style of the Cook Woolen Mill. Jonas M. Cook is the sole proprietor and Lemuel R. Barkley is the superintendent and buyer. Men's and women's seamless hosiery, lumbermen's socks, shawls and similar goods are made from woolen yarns, also yarns are made for sale.

Pennsylvania, South Bethlehem. Organization has been effected by the South Bethlehem Knitting Works, incorporated in October with capital stock of $10,000 with A. C. Graham, president; Osmon F. Reinhard, treasurer, and Geo. D. Robbins, general manager and buyer. As noted previously in the report of the incorporation of this company, it succeeds to the plant of Geo. D. Dobbins, which was sold at bankruptcy sale in September.

New Publications

[Any work noticed under this head can be obtained through the office of this journal.]

The Southern Commercial Congress; Third Annual Convention at Atlanta. Introduced by G. Grosvenor Dawe, managing director. Edited by LeRoy Hodges; 1,055 pages, 6 by 9; The Southern Commercial Congress, Southern Bldg., Washington, D. C. Price $5.

This is the report of the proceedings of the third annual convention of the Southern Commercial Congress held at Atlanta last March. It contains a vast amount of useful information regarding the resources of the South and the plans for developing these resources. The volume should be in the possession of every library and of every person who desires to understand the present aims of the Southern people, as it gives a clear idea of the development of the industrial and commercial possibilities whose possibilities are as yet barely touched. The reader will find here careful reports by experts in their respective departments dealing with such subjects as: Coast Line and Indentations; Navigable Streams; Water Powers; Volume of Rainfall; Wet Lands; Soil Varieties; Growing Hours for Vegetation; Forests; Minerals in Relation to Rivers and the Coast.

We are informed that the proceeds arising from the sale of the book will be devoted to the great construction work in which the Southern Commercial Congress has thus far made such an excellent record.

Dockham's Textile Manufacture and Dry Goods Trade; Dockham Publishing Co., 6 Beacon St., Boston, Mass. Price $6.00.

The 1911-12 edition of this directory has been issued and contains the lists and classifications of previous years. This number is dedicated to James G. F. Randolph, who has been with this Directory for many years. An excellent likeness of Mr. Randolph appears in this volume. The contents and plan of arrangement are well known and include detailed reports of the textile mills in the United States, Canada and Mexico, dealers in raw materials, dry goods commission merchants, jobbers, importers, etc. The list of directors of manufacturing companies is a good feature. The book gives evidence of the same careful preparation as in former years.

Fluctuations in Wool Prices, 1890-1911; The National Association of Wool Manufacturers, Boston, Mass.

This is an attractive and useful chart, 15 by 23 inches, showing the fluctuations of seven grades of wool and tops: 60s Botany tops (Bradford), Texas scoured, territory fine medium scoured, Ohio delaine, Ohio XX, Kentucky combing unwashed, Port Philip average grease (London). It covers the period from January, 1890, to October, 1911. The value of such charts are well known to our readers who have become familiar with them through the monthly publication in this magazine of charts showing the fluctuations of prices of the different textile materials. The chart issued by the National Association of Wool Manufacturers is printed in colors, enabling the lines for the different grades to be easily distinguished, and is well suited for framing.

Weaving and Designing; by Dr. Thomas Oliver, director of the South of Scotland Technical College; second edition, 172 pages, 5 1/2 by 8 1/2; Craighead Bros., Galashiels, Scotland. Price $2.

This work, of which the first edition appeared some years ago, is intended as a text book and it is especially adapted for the requirements of students in Great Britain. The following is an abstract of the table of contents: Textile Raw Materials, Yarn Numbering and Costing, Reed and Heald Numbering, Warp and Weft Calculations, Cloth Analysis, Costing of Cloths, Setting of Cloths, Textile Testing, Warp and Weft Preparation, Handloom Weaving, Powerloom Weaving, Designing, Color.

Year Book and Calendar for the Cotton Industry, 1912 (Jahrbuch mit Kalender fuer die gesamte Baumwoll-Industrie); revised by Prof. M. Lehmann, 474 pages, 3 1/2 by 6; Verlag von H. A. Ludwig Degener, Leipzig, Germany. Price, cloth, $1.25; leather, $2.

This is a revised edition of the year book and calendar that was compiled and first published by W. H. Uhland in 1880. It contains a valuable collection of miscellaneous information regarding cotton manufacturing and while it is, of course, not intended for English readers, yet it suggests the need and value of a similar work adapted for the industry in English speaking countries. The following abstract from the table of contents shows the scope of this book: History of the Cotton Industry; Cotton Growing, Grades, Statistics, Trade, American Cotton, Spinning, Twisting, Weaving, Yarn Numberings, Comparative Yarn Tables, Cloth Calculations, Yarn and Cloth Standards of the German Textile Exchanges, and Weights and Measures. The work contains numerous illustrations of machines, mill plans, weave drafts and textile appliances. The text is in German.

BUSINESS LITERATURE

Triplex Power Pumps; The Deane Steam Pump Company, Holyoke, Mass.

A new 31-page bulletin, D-205, giving an extensive discussion of the construction of its triplex power pumps of the vertical, double acting type. It explains the advantages of the triplex machine over other forms of power pumps, principal among which is that the combined discharge from the cylinders is practically uniform in quantity and pressure. The analyzed dissection of the pump, pointing out the features of design that are the outcome of this company's forty years' specialization in the building of power pumping machinery, will be found of particular interest. The

simplicity, durability, accessibility and solidity of the Deane triplex power pump are points that are specially emphasized. The pumps listed range in size of cylinders from 2 by 3 in. to 13 by 12 in., and in capacities from 11 1/2 to 2,475 gallons per minute. Some nine different styles of these pumps are illustrated and tables of dimensions, capacities, speeds, etc., are given of each. The pumps are arranged for belt or gear drive from any power source.

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Bulletin No. 104, Double-Action Triplex Piston Pumps; The Goulds Mfg. Co., Seneca Falls, N. Y.

This is an 8 inch by 10 inch six-page folder, designed to be connected in loose leaf binder with those previously sent out by this company. It contains engravings of four pumps and some of the different parts, a repair chart, giving a sectional view, for convenience in ordering extra parts, also specifications, dimensions, and capacities of the different pumps. Bulletin No. 106 of this series treats of Vacuum and Stuff Pumps, and illustrates and gives specifications of eight vacuum and stuff pumps.

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J-M Roofing Salesman.

The Current number of The J-M Roofing Salesman has interesting full-page view of The Republic Stamping and Enameling Co. of Canton, O., who have used J-M Asbestos Roofing on both flat and saw-tooth construction for now more than 12 years and have just contracted for another 600 squares for new buildings. Other illustrations include the Birmingham, Ala., plant of the American Steel & Wire Co., now covered with nearly 10 acres of J-M Asbestos Roofing. The J-M Roofing Salesman is mailed free of cost to prospective builders upon application to the H. W. Johns-Manville Co., Cleveland, O., U. S. A.

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The Goulds Mfg. Co., Seneca Falls, N. Y.

Bulletin 107 describes and illustrates the deep well triplex pumps.

Bulletin 108 describes and illustrates the deep well working heads.

Bulletin 109 describes and illustrates the pumps for special services built by this firm.

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CALENDARS

The Dinsmore Manufacturing Co., Salem, Mass., dealers in mill sewing machines and supplies, have issued a very attractive wall calendar with an attractive picture of a young girl.

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Thomas Wolstenholme Sons & Co., manufacturers of French and Bradford spun yarns, Philadelphia, Pa. A large wall pad, 22 by 14 inches, with a leaf for each day of the year.

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The Draper Co., Hopedale, Mass. A wall pad 11 by 14 inches which is a memorandum pad and calendar combined. It gives an excellent view of the Draper cottages and an illustration of their Northrop loom.

The R. H. Hood Co., manufacturers of comb circles and fallers for wool, flax, silk, jute and ramie, 1842 Germantown Ave., Philadelphia, Pa., are sending out to the trade a very attractive wall calendar.

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The Wonalancet Co., manufacturers of carded cotton for woolen mills, Nashua, N. H., are sending out to the trade an attractive daily calendar mounted on a substantial and well polished cherry board.

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The Saco-Pettee Co., Newton Upper Falls, Mass., are sending out to the trade a dainty desk tablet and calendar, with a space for memorandums.

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The Mason Machine Works, Taunton, Mass., send their Christmas compliments in the shape of an attractive red leather desk calendar with changeable monthly cards. It is very attractively gotten up and most convenient for desk use.

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The William Kedward Dyeing Co., 246 Chestnut St., Philadelphia, Pa. A large wall calendar for office use.

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C. S. Dodge, Lowell, Mass., is sending out to the trade a neat calendar on which is shown a picture of his latest rag picker with condenser.

Industrial Notes

BIG DEMAND FOR THE "DOUBLE BUCK HOFFMAN" PRESS

The United States Hoffman Company, Syracuse, N. Y., manufacturers of hosiery and knit goods presses, report an exceedingly good season. We learn that the number of shipments made by this concern is more than double the number at the corresponding period last year. The plant has for several months been working night and day in order to prevent congestion and to make prompt deliveries. Chas. H. Lewis, vice-president of the company, states that with the exception of the double buck hosiery and knit goods presses, they had been able to keep fairly well up to schedule, but they had literally been swamped with orders for the double buck machines. Mr. Lewis seemed to think, however, that they had the situation well in hand and that shipments of this model could be made within a reasonable length of time, say ten days or two weeks.

He added that, although the double buck press was fundamentally the same as the single buck models in so far as the principle of applying steam to the garments is concerned, it was practically a new model, and as such the demand had been the most remarkable that he had ever known during his many years of experience in manufacturing hosiery and knit goods pressing machinery.

The "Hoff-Man" Company has issued an interesting and attractive catalogue showing both the single and double buck presses, explaining in detail the "Hoff-Man" principle and operation, and the action of steam on the goods. This catalogue is for general distribution and contains data of interest to those who desire to keep pace with the times in regard to ways and means of improving the appearance of their product and of increasing the output of their plant.

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REMOVAL

A. W. Buhlmann, Textile Engineer of New York, will move on or about January 15th from the Silk Exchange building, 487 Broadway, to more spacious quarters in the Fifth Avenue building, Madison Square.

The Fifth Avenue building is in the heart of the new mercantile district on Fifth Avenue, Broadway, Twenty-third and Twenty-fourth Streets, and is considered one of the most up-to-date office buildings in America.

The growth of Mr. Buhlmann's business has been remarkably rapid. He is a graduate of the Silk Textile School of Zurich, Switzerland, and of the Royal Textile Academy, Chemnitz, and has made a specialty of installing finishing plants.

He is the representative of some of the foremost European builders of finishing machinery, and by making frequent trips abroad keeps in touch with the latest developments and inventions in textile machinery.

The transfer of his offices to more commodious quarters in the heart of the new textile district enables him to give more efficient service to his customers and makes it more convenient for them to visit him when in New York.

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THE HELLER & MERZ COMPANY

The Boston office and warehouse of the Heller & Merz Co., dealers in dyestuffs and chemicals, are now located at 247 Atlantic Ave., where they have larger and more convenient quarters. Their Boston branch will be in charge of R. C. Cox, who has heretofore represented them in Western Massachusetts, and George D. Smith, who has been connected with their Boston branch for a number of years. N. A. Billings, who has been connected with their New York house, will be the resident representative in Springfield, Mass. He will look after their interests in Western Massachusetts and adjoining territory.

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THE TURNER CONSTRUCTION CO.

An interesting and graphic picture is issued by the Barrett Mfg. Co., showing an impressive group of concrete buildings which have been erected in different parts of the country within the past nine years by the Turner Construction Co., at an approximate cost of $12,000,000. The buildings cover a great variety of industries. The special feature which the circular emphasizes is that 95 per cent. of the entire roof area of these buildings is covered with the Barrett specification roofs, which require no paint or other maintenance costs. Roofs of this type have lasted without attention for thirty-five years and are still in serviceable condition. A copy of the Barrett specification for roofs may be had by request.

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REGARDING FIREPROOF BUILDINGS

At a recent meeting of the American Society of Mechanical Engineers at New York the statement was made that the United States is paying a preventable loss of more than $366,000,000 annually, this being the difference between European losses and those in our own country. In discussing this, Charles T. Main of Boston stated that the estimated cost of private fire protection, including capital invested in construction and equipment, is $50,000,000, with an interest account and watchmen's cost amounting to $18,000,000 more. It does not seem possible to omit very much of the public fire-fighting apparatus and systems or the private investment, for this purpose, even if every building were proof against destruction by fire inside and outside, because the combustible contents of the city buildings and factories make it necessary to put in hydrants, sprinkler and pumping systems and to maintain fire departments in the same manner as they are now installed and maintained. The spreading of fire would be reduced and the losses decreased accordingly.

In textile mills the value of the buildings is not more than one-quarter of the total value of the property, and the value of the property and of the stock in process is also a very considerable amount. In some of the rooms in a cotton mill the stock in process is very inflammable, and a fire will start from a spark or a heated bearing on a machine and go from one end to the other almost like a flash of gunpowder. The insurance companies therefore require, even in fireproof buildings, a system of fire protection of the same capacity and efficiency as is required in buildings of slow-burning construction. As the losses on the contents of the buildings form a large part of our fire losses, it would be well to look for better regulations in regard to the storage of combustibles in our city buildings, including the retail stores.

In regard to the statement that fireproof buildings can be built as cheaply as those of the slow-burning type, Mr. Main stated that in competition for a mill building recently, he obtained prices showing the cost of the concrete building to be about 25 per cent. more than for regular mill construction. This is probably due to the fact that the floor loads in textile mill work are comparatively light.

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The Second Annual Christmas luncheon of the Boston Wool Trade was held at the Hotel Essex on the afternoon of Dec. 23d. These meetings are for the purpose of bringing the trade together in a social way to promote good fellowship. The principal speakers were the Hon. Samuel L. Powers and Lafayette G. Blair. About one hundred and fifty were present and the best of Christmas feeling prevailed.

THE COMING TEXTILE EXPOSITION

The interest is constantly increasing in the coming textile exposition to be held in Mechanics Building, Boston, the week of April 22-27. Never before have so many of the large interests been enlisted and from present indications practically all of the leading firms will be represented. In former years the cotton exhibits have predominated, but this time the silk and woolen industries are both to be seen and these together with the cement and concrete department devoted to mill construction, the power department, under the auspices of the New England Association of Commercial Engineers, the finished goods department, in which will be shown all kinds of finished fabrics by large manufacturers, as well as made up goods by leading New England modistes and garment makers, will constitute a complete array from the raw material and methods, to the ready-to-wear product such as has never before been attempted.

The demand for space has been so great that even at this early date in the main department practically all space has been sold and the probabilities are that the adjoining hall may have to be engaged, which will mean that approximately 125,000 square feet will be available. This is unprecedented in a purely textile exhibit.

This condition has been brought about largely through the success of previous expositions held under the auspices of the Textile Exhibitors' Association and under the personal direction of its secretary, Chester I. Campbell, who has recently returned from abroad in the interests of the Exposition, and who has a number of novelties which he expects to show at that time.

Many letters have been received by interested parties regarding the showing of the knitting and woolen industries as well as those relating to the power department and cement construction.

The executive offices of the management are at 5 Park Square, Boston, and any information regarding the various departments may be obtained by writing or calling there.

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The Appalachian Mills at Knoxville, Tenn., who manufacture men's cotton underwear exclusively, are selling their entire output from the mill direct through the firm of Elmer E. Hartzell, 346 Broadway, New York.

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Under the title "Technology and Industrial Efficiency," the proceedings of the Congress of Technology, held in Boston last April at the Massachusetts Institute of Technology, have been published in a volume of about 500 pages. Some seventy papers are included, and these form together a valuable and up to date record of the present state of industrial science, and a presentation of some of its problems and probable solutions. The six sections into which the Congress was divided are represented by papers on: Scientific Investigation and Control of Industrial Processes; Technological Education and its Relations to Industrial Development; Administration and Management; Recent Industrial Development; Public Health and Sanitation; Architecture.

MILL ENGINEER

Charles H. Nichols, 1133 Broadway, New York, mill and factory engineer and architect, has been in practice as a consulting engineer for several years, and has had a long experience in all branches of eigineering in connection with buildings, and in architecture.

While in practice as a consulting engineer, he has designed the mechanical and electrical plants, including the heating, ventilation, illumination, boiler and generator equipments, plumbing and fire protection, for a number of large buildings, including office buildings, U. S. post offices, libraries, churches and residences.

He is now prepared to make the plans and specifications for mill and factory buildings, including the foundations, structural work, power plant, ventilation, illumination, fire protection and sanitation.

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WHAT IS THE HEIGHT OF A DAM?

It is rather surprising to find that there is no rigid rule for measuring the height of a dam. Although possibly one-third of all the water power suits relate to the height of the dam or stage of water there seems to be absolutely no judicial decision on the subject. A lawyer explains how a court would ignore such a question as a rule to measure the height of a dam.

In reply to a request for his opinion on this much discussed question, Chas. T. Main, engineer of Boston, who is an authority on water power developments, states that the height of a dam usually means the height from the bed of the river at its lowest point to the crest of the dam. That is the height of the physical structure. The height usually varies from the point of maximum, decreasing as it approaches the banks of the river on either side. It usually has nothing to do with the fall or the power produced, as for example, in a development in which water is carried for some distance through canals, penstocks, or flumes the dam which diverts the water from the river at the head works into conduits may be only a few feet high, whereas, the head is the difference between the level of the water at the end of the conduit, usually in a terminal reservoir if the distance is long, and the surface of the water in the river below the station, which is in some cases as high as a thousand feet or more.

It is only in such developments as when the whole head is created by the construction of a dam that the height of the dam approximates the head producing power. In some instances it is necessary to go to a considerable distance below the bed of the stream for a foundation for a dam, but the depth of the foundation below the bed, in Mr. Main's opinion, should not be included in the height of the dam.

The height of the dam cannot be measured by the height of the water above and below the same, as this is usually a varying quantity, depending upon the amount of water which is flowing over the dam and the various conditions of the river which effect the flow.

C. J. H. WOODBURY'S RECOVERY

The many friends of C. J. H. Woodbury, secretary of the National Association of Cotton Manufacturers, will be glad to learn that he is improving from an attack of illness which seized him several weeks ago. He is able to be up and about the house, but may not return to the office for some time yet. His illness has given his large circle of friends an opportunity to show the appreciation in which he is held and they hope he will soon be out and about again in his usual good health.

VEGETABLE FIBER IN WOOL

A meeting of the International Committee on Vegetable Fiber in Wool was held at the offices of Messrs. Dalgety & Co., London. The question of a cheap and suitable pack again formed the chief point for discussion and it was reported that important tests are being made of closely woven packs made entirely from paper. The High Commissioners for the Australian Colonies and for the Dominion of New Zealand are interesting themselves in this question, and while considerable improvement has been made in the packing of wools in the Colonies the great desideratum is a perfect pack at a cheaper price than the paper-lined pack recommended by the Committee.

It was unanimously resolved, on the proposition of Albert Illingworth, of Bradford, seconded by Acton Adams, of New Zealand, that the resolution adopted by the Roubaix Conference should be supported, and that all consumers of wool be earnestly recommended to give preference to wools which are packed in suitable tares. It was also resolved that another International Congress should be held in London next May.

The French Association requested the appointment of five additional members on this Committee, and the following were elected: M. Edmond Masurel, of Messrs. Francois Masurel Freres, Tourcoing; M. Chambaud, of Messrs. Schwartze & Co., Mulhausen; M. Paul Motte, of Messrs. Motte, Bossut & Fils, Roubaix; M. Charles David, of Messrs. David, Fils & Co., Amiens; M. Leon Jung, Secretary L'Union des Filateurs Francais, Tourcoing.

The important question of how to deal with the matter in South America was discussed, and it was determined to have show cards and cases prepared giving samples of cloths affected by jute fiber used in South America which are the cause of the trouble. These are to be sent to the various baraccas and handlers of wool in South America, and also to the Colonial wool warehouses and salesrooms.—Yorkshire Post.

The Howard & Bullough American Machine Co., Ltd., which has held an English charter, has recently been incorporated under the laws of Maine with a capital stock amounting to $3,600,000. The new company's name is the H. & B. American Machine Co. Charles E. Riley is president, E. R. Richardson, treasurer, and E. L. Martin, secretary. The management and personnel continues exactly the same.

FIRE LOSS EQUAL TO A YEAR'S WORSTED PRODUCTION

According to the United States Census of Manufactures covering the year 1905, the total value of woolen goods produced in that year was $142,200,000; the value of worsted goods was $165,745,000; the value of silk and silken goods was $133,300,000. As compared with these figures, the loss by fire in the United States during that same year was $165,221,650. It will be noted that this is just about equal to the worsted production and larger than the average of the other figures mentioned. It is believed that a comparison of this sort will bring the matter home to the minds of business people generally, much more strikingly than a bare statement of what the loss was in dollars and cents. The next thing which needs driving home in the same spot is the fact that the greater part of this loss would have been avoided if the principal buildings involved had been equipped with a modern system of automatic sprinklers. What the insurance interests think of the sprinkler is shown by their voluntarily reducing insurance rates by about one-half in buildings so equipped.

ANTICIPATING GOOD BUSINESS FOR 1912

The Arlington Machine Works reports a very satisfactory business the past year and are looking forward to even a larger business the coming year. Foundations are already built for an addition 75 by 65, 2 stories high, and foundations are partly in for another building. Arthur Birch tells us he has no idea of making any changes or of consolidating his works with any other concern.

The John Herron Art Institute, in Indianapolis, is now offering a course of Applied Design, in which is taken up the designing and manufacturing of all kinds of woven and printed fabrics, wall and floor coverings, etc. They plan to equip the school room with looms and other necessary machinery. Miss Edna Browning Ruby, a graduate of the School of Industrial Art of the Pennsylvania Museum, Philadelphia, and a practical designer, is the instructor in charge.

Massachusetts, North Brookfield. According to Wm. J. Wilson, manager of the Oxford Linen Mills, plans have been made to double the spinning capacity inside of three or four months. A 300 h. p. steam engine has arrived and will be set up at once.

Massachusetts, North Dighton. The Mount Hope Finishing Co. is building an addition which will be 2 stories high, 180 by 120 ft., with capacity for 12 tenter frames on the first floor. The second floor will be used for packing, shading and inspecting. The brick walls are now up 1 1/2 stories and floor timbers are being set. This building will be steam heated, electric lighted and equipped with automatic sprinklers. Practically all material and machinery to be installed at the present have been contracted for. A 2-story addition, 50 by 120 ft., for calender room and packing, was recently completed.

WORLD'S PRODUCTION AND CONSUMPTION OF WOOL

The following information regarding the production and consumption of wool is extracted from the report on the foreign trade of France in 1910 by the President of the French Permanent Customs Values Commission:

The number of sheep in Europe is steadily decreasing; the increase in the yield of wool per sheep has up to the present kept the output of wool on the Continent almost constant, but this will soon cease to be the case, since the yield per sheep cannot increase much in the future. The North American flocks should increase in size, at any rate for some years to come. The Australian flocks, temporarily lessened by drought, have begun to grow again. The number of sheep in Australia and New Zealand increased from 110,480,000 in 1909 to 115,450,000 in 1910. The yield of wool per sheep has also increased considerably, thanks to judicious crossing, selection, and the infusion of merino blood. In the Argentine the flocks moved into colder regions bore the change of climate very well. The drought of 1909 destroyed many lambs and greatly reduced the output of wool in 1910, but there is stated to be an improvement this year.

The world's production of wool in 1910 is estimated at 2,948 million pounds. Making allowance for the quantities consumed by local industries in the countries of exportation, the supplies available for the manufacturers of Europe and North America were as follows:

Production of

	1,000 lbs.
Continent of Europe	418,572
United Kingdom	142,514
North America	331,868

Exports from

Australasia	852,093
Argentina and Uruguay	431,528
South Africa	124,575
Other Countries Outside Europe	236,194
Total	2,537,344

The quantity available in 1909 amounted to 2,583,077,200 lbs. The supply for the manufacturing countries was thus about the same in 1910 as in the preceding year; the supply from Australasia increased by 7 per cent., and that from other exporting countries decreased.

The consumption of wool has grown very slowly in the last decade, increasing during the ten years 1901-10 by only 13 per cent. In 1910 there was an increase, as compared with 1909, in the consumption in Europe, and especially in the United Kingdom, and a considerable decline in that in North America. The consumption of raw wool during the year 1910 is estimated to be as follows:

	1,000 lbs.
Continent of Europe	1,418,120
United Kingdom	610,700
North America	508,200

According to unpublished estimates by M. Ch. Marteau, the consumption of wool in France was greater in the last decade of the 19th century than in the first ten years of the present. This is ascribed to two causes, viz., the change in women's dress, and the improvements in the dyeing and making of wool substitutes, viz., cotton tissues and mixed stuffs containing a very large proportion of cotton and shoddy.—Textile Recorder.

BETICOL

Another successful finishing compound which will be welcomed by the practical finisher, has been brought out by the Arabol Mfg. Co. of New York. Its name is Beticol. It finishes and stiffens without coating and does not start the colors in the material, nor does it "scale" or "mark" when scratched. Beticol is soluble in cold water. It has been tried by leading finishers on cotton, silk and woolen goods with satisfactory results.

REMOVAL

Jacobs & Co., graders and dealers in all sorts of wool rags, have removed their New York office to 28 Prince St.

Walter B. Snow, publicity engineer, 170 Summer St., Boston, Mass., announces a recent addition to the staff of Sidney G. Koon, M. M. E., four years editor of "International Marine Engineering." John S. Nicholl, B. S., lately with the New York Edison Company, has also recently joined Mr. Snow's staff.

Mr. C. W. Stone has been appointed manager of the lighting department of the General Electric Co., Schenectady, N. Y., to succeed C. D. Haskins, deceased.

Pennsylvania, Philadelphia. Estimates are being asked on a 4-story addition, 92 by 43 ft., with a wing, 43 by 70 ft., by the Peerless Co., Jasper and Willard Sts. They are dyers of skein silks and silk hosiery and bleachers of woolen hosiery and have capital stock of $50,000. At present the plant is very busy in all departments and this enlargement is the second within two or three years that has been made necessary by the growth of the business. Harry Brewin is president and J. N. Lardenburg, treasurer.

Pennsylvania, Phildelphia. Benj. F. Anderson and Joseph Schmidtz, formerly of the Nicetown Dye Works, have taken over the dyeing department of the Standard Hosiery Dyeing & Finishing Works at 3213-15 Frankford Ave., and 3212-14 Aber St., which they will operate in the future under the name of the Universal Dye Works. The new owners, in addition to overhauling the equipment of the plant and putting it in first class condition, are also installing machinery of the latest improved design for the dyeing of hosiery and skein yarns, cotton, mercerized, silk and wool; with a capacity of 8000 pounds per day.

Recent Textile Patents

BOBBIN CARRIER. 1,009,749. Richard K. Hohmann, San Diego, Cal.

BOBBIN FEEDING and Counting Apparatus. 1,010,332. John H. Wall, Bristol, R. I.

BRAIDING MACHINE. 1,011,913. Hermann Buscher, Langerfeld, Germany.

DYEING APPARATUS. 1,010,637. Oswin Kircheis, Philadelphia, Pa.

DYEING MACHINE. Revolving Collapsible Beam Vacuum. 1,010,513. Frank M. Morton, Phoenix, Ala.

DYEING MACHINE. 1,010,274. Julius Leisel, Charlotte, N. C.

EMBROIDERING MACHINE, Jacquard Mechanism for. 1,010,475. Robert Zahn, Plauen, Germany.

CLOTH FINISHING Machines, Detector Device for. 1,012,379. Isaac Longden, Three Rivers, Mass.

LOOMS, Automatic Spool-clearing Apparatus for Weft-replenishing. 1,011,065. Albert G. Koechlin, Steinen, Germany.

LOOMS, Machine for Straightening Tube-frames for Axminster. 13,335. Thomas P. Walsh, Boston, Mass.

LOOM Warp Stop Motion. 1,011,237. Alonzo E. Rhoades, Hopedale, Mass.

LOOM Thread-cutting Temple. 1,011,220. Cabell W. Megginson, Danville, Va.

LOOMS, Filling Thread Cutting Mechanism for Weft Replenishing. 1,009,997. Eppa H. Ryon, Waltham, Mass.

LOOMS, Automatic Reshuttling Apparatus for. 1,011,466. Walter A. Mather, Manchester, England.

LOOMS, Automatic Weft Spool Changing Apparatus for Power. 1,011,969. Albert G. Koechlin, Steinen, Germany.

LOOMS, Needle Motion for. 1,009,872. William Wattie, Waltham, Mass.

SHUTTLE. 1,010,873. Morrill E. Deering, Pittsfield, Me.

SHUTTLE. 1,011,060. George Hulme and Patrick H. Rowley, Providence, R. I.

SPOOLING MACHINE. 1,011,241. Hermann Polster and Arno Lang, Plauen, Germany.

TEXTILE-MACHINE Double Traverse. 1,011,137. Harvey C. Sturtevant, Jamestown, N. Y.

WARP FRAMES. Beam Supporting Attachment for. 1,010,298. Frank M. Morton, Phoenix, Ala.

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Pennsylvania, Philadelphia. H. W. Clay, who started up a small plant at 2240 N. Orkney St., in which he manufactured a line of seamless hosiery, has gone out of business and disposed of his machinery.

APPLICATIONS FOR REGISTERED TRADE MARKS

These applications have been officially published by the U. S. Patent Office, so that any person who believes a registration would interfere with established rights, may have an opportunity to object within the specified time.

39,664. Stockings. Mark: Wire Tipped. Owner: O'Callaghan & Fedden, New York.

43,181. Flannel waistcoats, pajamas, chemises, etc. Mark: Securitas. Owner: Edouard Leurent, Tourcoing, France.

44,957. Thread of all kinds. Mark: Needle-on. Owner: Charles Fisher, San Francisco, Cal.

52,246. Ribbons. Mark: Comet. Owner: Carson, Pirie, Scott & Co., Chicago, Ill.

58,725. Handkerchiefs. Mark: Diamond. Owner: Newark Embroidery Works, Newark, N. J.

59,050. Hosiery. Mark: Spring Maid. Owner: The Pittsburgh Dry Goods Co., Pittsburgh, Pa.

59,479. Silk foulard. Mark: Rainette. Owner: Marshall Field & Co., Chicago, Ill.

59,514. Worsted cloths. Mark: Perseverance. Owner: Perseverance Worsted Co., Woonsocket, R. I.

57,643. Muslin, lawn, nainsook, etc. Mark: Kenco. Owner: Kent Mfg. Co., New York.

57,735. Dress percales and shirtings. Mark: Harmong. Owner: Garner Print Works, West Haverstraw, N. Y.

58,251. Hosiery. Mark: Mahomi Maid. Owner: Manchester Hosiery Mills Co., Manchester, Pa.

58,966. Hosiery. Mark: Try-on-a. Owner: Wear Knitting Co., Tryon, N. C.

55,773. Dust-cloths. Mark: Absorbo. Owner: Chicago Feather Duster Co., Chicago, Ill.

57,972. Cotton piece goods. Mark: Pride of Atlantic. Owner: Atlantic Cotton Mills, Lawrence, Mass.

58,942. Underwear. Mark: Patrica. Owner: Eva O. Farnsworth, New York.

59,428. Hosiery. Mark: X X. Owner: Middlesex Co., Lowell, Mass.

57,304. Woven woolen fabric. Mark: Nitweve. Owner: Worumbo Mfg. Co., New York.

58,439. Hosiery. Mark: Sister Sue Stockings. Owner: John M. Given, Pittsburg, Pa.

58,738. Spool cotton, sewing cotton, etc. Mark: Schiflonia. Owner: The American Thread Co., Jersey City, N. J.

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Alfred Suter, textile engineer, 487 Broadway, New York, sailed for Europe Dec. 9th and expects to travel in Germany, Switzerland, France and England in order to look up new devices and processes which has come to his knowledge and see if they are suited for American manufacturers.